

THE IRON AGE

New York, October 20, 1921

ESTABLISHED 1855

VOL. 108: No. 16

Steel Foundry Has Special Operating Features

National Steel Foundries Add Two Tilting
Open-Hearth Furnaces with Removable Ports
—Oven for Drying Molds Opens at Both Ends

NEW devices included in the new addition to the plant of the National Steel Foundries, Milwaukee, Wis., include removable ports for the two 25-ton tilting open-hearth steel furnaces, special ladle and stopper drying devices, a new type of core drying oven, new method of handling shake-out sand and a novel arrangement for handling the furnace ports. The plant is located in the north-eastern part of Milwaukee, between the Milwaukee River and the Ashland division of the Chicago & Northwestern Railway, occupies a tract of 15 acres, and now has a total floor space of 219,885 sq. ft., with a capacity of 200 tons per day.

The buildings, which are all of brick and steel construction, have the pond, saw-tooth and monitor types of roofs, and are exceptionally well lighted and ventilated. The two new open-hearth furnaces, which have also just been completed, are of the tilting types, and were designed by James H. Swindell.

These furnaces are tilted by hydraulic pressure,

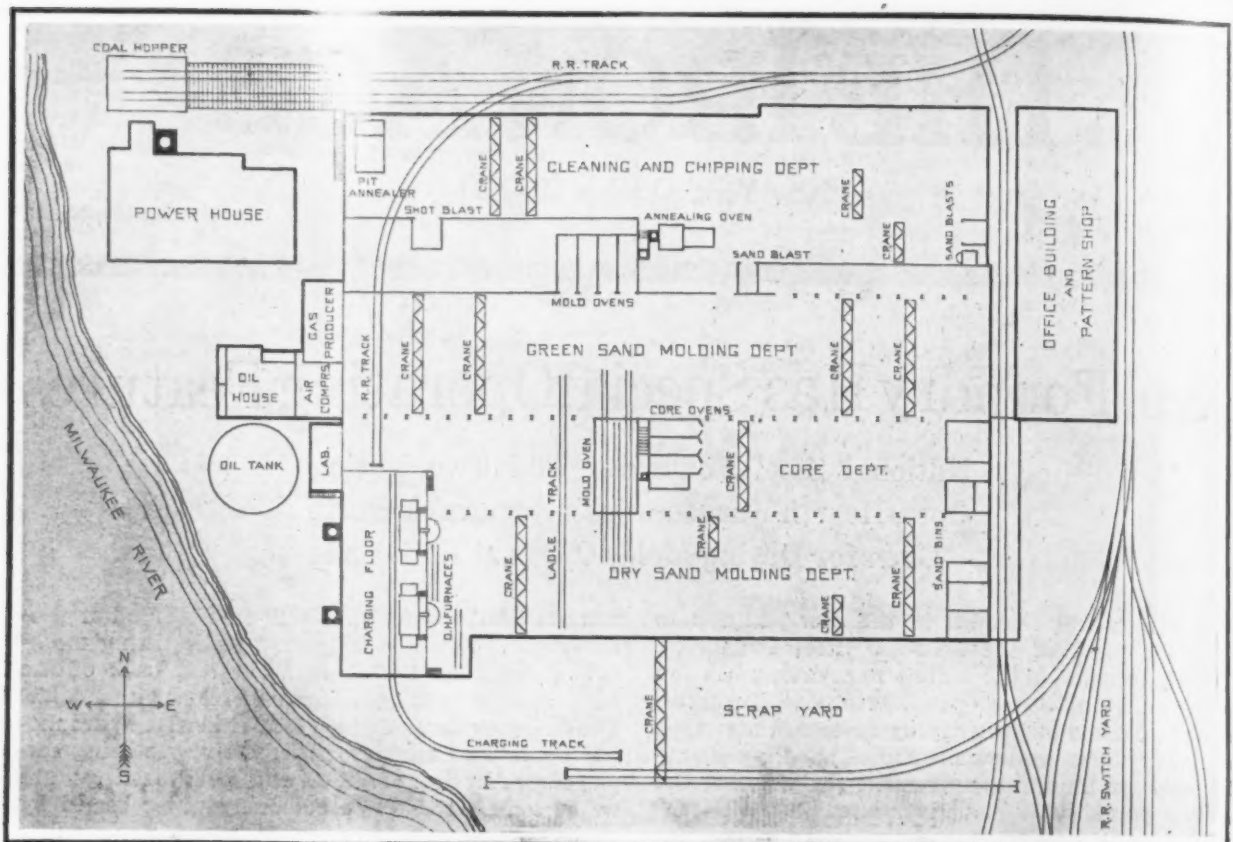
and are designed for operation on either oil or producer gas. Levers for operating the tilting mechanism are located both in front and back of the furnaces, permitting operation from either side. The charging doors and ports are likewise hydraulically operated, Critchlow hydraulic valves being employed. All door frames and port castings are water cooled, the end ports being water sealed by the overflow water from the ports and door frames.

These furnaces are provided with removable end ports, which can be quickly removed for relining and replaced with spare ports, two of which are always kept ready for immediate use. The end ports are mounted on wheels and travel on a track. They are raised from the water-sealed pan, on the uptake, by means of hydraulic cylinders located on the sides of the ports, and operated by levers on the charging floor.

The two "outside" end ports, which extend beyond the span of the cranes, travel on rails to the



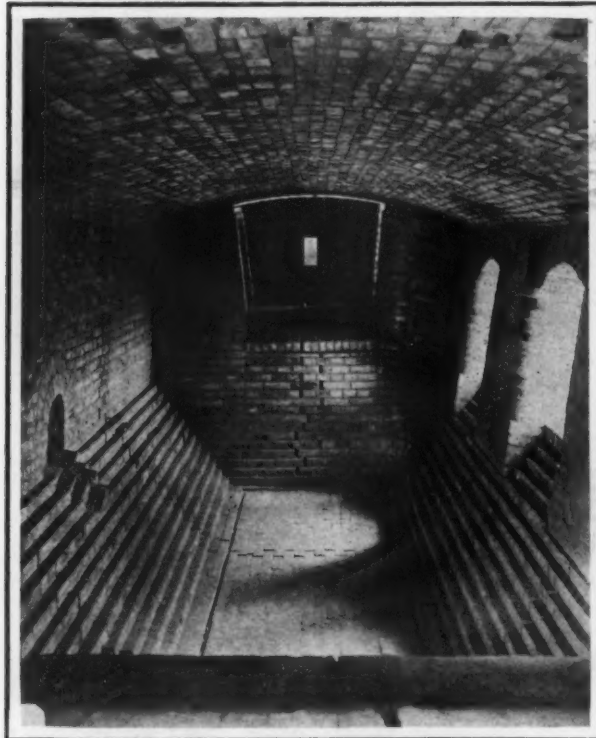
When the Furnace Is Tilted It Automatically Raises a Section of the Flooring. Beyond, at the right, stands the charging machine, with its trolley frame extending back to the conductor shown near extreme edge of cut



This Layout Shows How Compact the Plant Is, How Molten Metal Is Transferred from the Open-Hearth Furnaces in the Dry Sand Molding Department to the Green Sand Molding Department, How the Mold Drying and Core Drying Ovens Are Conveniently Located Between the Two Molding Areas

ends of the charging floor onto a transfer conveyor, which carries them out of line of the furnaces and in line with another track, over which they are moved "in" to a point underneath the crane, for removal and replacement.

The furnace proper tilts on roller bearings of large dimensions, and can be rolled over for discharging a heat, or when making a new bottom or back wall, while the oil or gas is on, as the ports



Interior of One of the Open-Hearth Furnaces, Showing Port Construction. Three expansion joints are plainly to be seen, one under the port, the other two running across the furnace

remain in the center line or axis, irrespective of the position of the furnace. The extreme angle to which this type of furnace can be tilted brings the tap hole to the very bottom, and permits complete draining of the slag.

Each furnace has four slag pockets, two underneath each end port. Four regenerators for each furnace (two air and two gas) are located under the charging floor, and are connected to the slag pockets by flues. Tate Jones Company's circulating oil system, and Kirkwood types of burners, are used.

The butterfly valves are located under the charging floor and are of the Siemens type, manufactured by the Velte Foundry & Machine Co. They are operated by compressed air from the charging floor. The spacious charging floor is of brick and steel construction, very cool, and has excellent light and ventilation.

Standard 25-ton bottom pour ladles are used, the oil-fired ladle drier being of a new and special design. Ladle trucks, which run on a track, are used to convey the ladles from the dry sand to the green sand molding floors. The stopper drier, which is also of a special design, has a capacity of eight stoppers, the heat being so controlled that no direct flame comes in contact with the stopper heads.

The furnaces are charged by a 5-ton Wellman-Seaver-Morgan electrically operated charging machine, the charging boxes and cars being of standard design. The loaded charging cars are hauled up a curved incline trestle, from the scrap yard to the charging floor, by means of a steel cable and electric winch.

Two 40-ton ladle cranes travel the full length of this building and over the tops of the furnaces, for the removing and replacing of the end ports, etc., which arrangement also permits the pouring of two heats in quick succession (one from each furnace) or the use of the farther crane in case the near one is laid up for repairs. A new 3-track



General View of the Two Tilting Furnaces, Showing Ladles on Buggies; Showing Also How the Same Cranes May Be Used on Either Side of the Furnaces. The ends of the hydraulic tilting cylinders appear beneath the furnaces

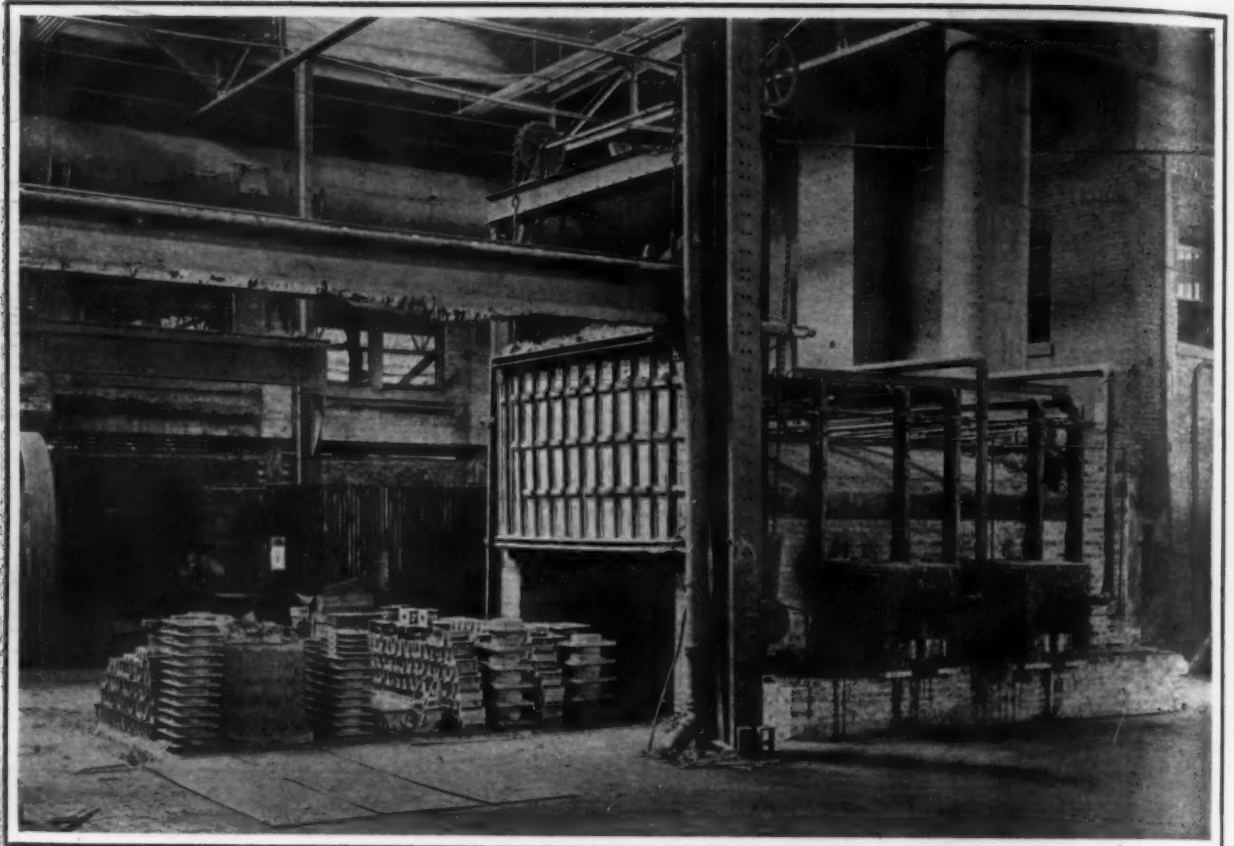
mold drying oven of special design has also been installed, and is so located as to receive the dry sand molds at either end.

The green sand molding department has a reinforced concrete and brick floor, with a basement and a sub-basement underneath. The first basement is used for pattern storage; the sub-basement

contains the sand storage bins and sand mills. Shake-out sand is handled in a unique manner. It is conveyed by clam shell buckets to chutes in the molding floors, passes through revolving screens into hoppers above the sand mills in the sub-basement, and is returned to hoppers on the molding floors by means of a bucket conveyor.



While the Port Ends Between the Two Furnaces May Be Lifted from Their Water Seals by the Crane, and Thus Replaced by Spares When Repairs Are Needed, the Two at the Outer Ends Are Beyond the Crane Runway. Hence these two are handled on special tracks, by which they are brought within reach of the crane



Two Types of Annealing Furnaces Are in Use in the Plant. This is the car-type furnace, located in the cleaning and chipping department

Molding machines installed consist of two 30 x 28 in. and two 30 x 36 in. International turn-over draw machines with conveying racks, and three 60 x 72 in. plain jolt machines. The chipping and cleaning department has both dirt and creosote block floors, and is equipped with one shot-blast and two sand-blast machines of the Pangborn type, and two sand-blast machines of the Hoevel type.

The welding department, in which both electric and acetylene welding are done, is equipped with

one 1000-ampere Westinghouse electric generator, and two 300-lb. Davis-Bournonville acetylene generators. The cleaning department is fitted throughout with improved types of automatic chippers, cut-off saws, portable and stationary grinders, etc.

Two annealing furnaces are located in this department, one being of the "car" type for the smaller castings, and the other of the "pit" type for the larger castings.

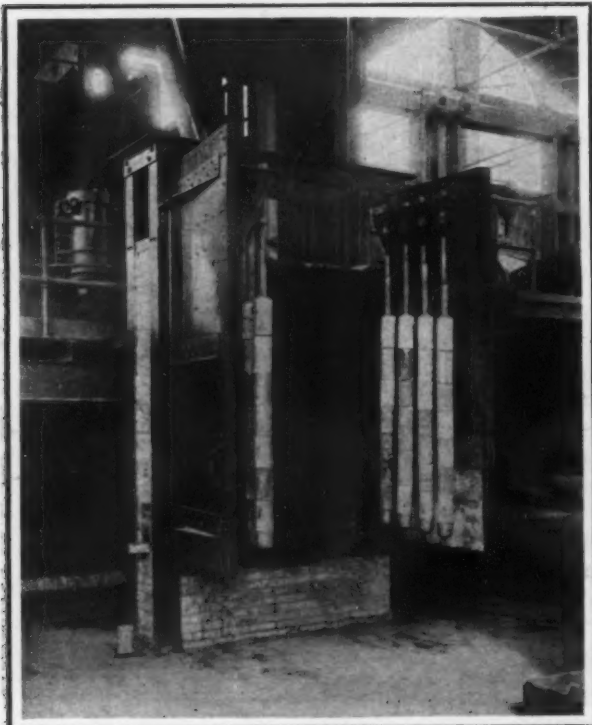
Fourteen electric traveling cranes are used in this plant. This equipment consists of two 40-ton Niles; two 20-ton, four 10-ton and two 5-ton Pawling & Harnischfeger; one 20-ton and one 15-ton Shaw; one 10-ton Waukesha and one 5-ton Cleveland. This makes an aggregate nominal lifting capacity of 220 tons.

The pattern shop, which in normal times employs a force of about thirty men, and in which both wood and metal patterns are made, occupies a floor space of 12,669 sq. ft. A modern laboratory is most conveniently located directly back of the charging floor of the furnaces.

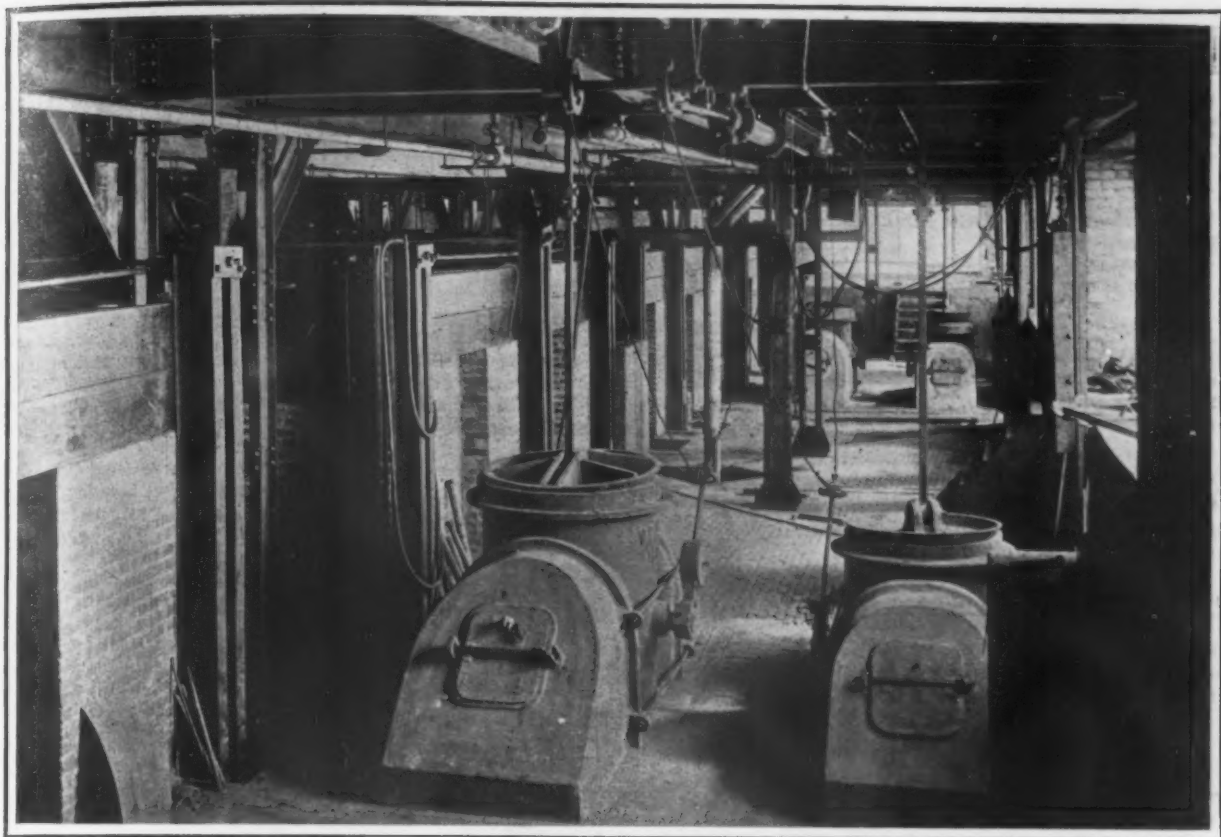
Fuel oil storage is provided back of the foundry buildings. The tanks consist of a battery of five 10,000-gal. steel tanks and one 260,000-gal. concrete tank, giving a total storage capacity of 310,000 gal., or approximately thirty-eight carloads. The location and elevation of the unloading track, in relation to the storage tanks, are such that the oil from the tank cars is discharged by gravity directly into the tanks.

The air-compressor equipment consists of five National Brake & Electric Co. type 3-VD 550 cu. ft. and one 3VS-23-300 cu. ft. automatically controlled compressors.

The relief department, of which about 95 per cent of the employees are members, is operated on a plan which not only provides sick and death benefits for its members at nominal cost, but also pensions the widows and dependent children of mem-



In This Special Type of Stopper Drier Space Is Provided for Eight Stoppers, Hung as Shown



Butterfly Valves for Handling Air and Gas Flow Are Located, as Usual, Beneath the Charging Floor

bers who have been in the employ of the company continuously for a period of two years or more.

A completely outfitted modern dispensary, in charge of a registered nurse, is also maintained, where first aid is administered to accident cases. The plant is well equipped with safety appliances, the safety work being in charge of a committee composed of employees of the various departments. This committee makes monthly inspections of all

departments, and recommends the installation of safety devices where necessary.

The National Steel Foundries also operate a brass foundry and a large modern gray iron foundry, located directly south of the steel foundry buildings. When operating under normal conditions (before the completion of the new addition) about 500 men were employed. This number will now be considerably augmented.



These Three Core Ovens Lie Between the Green Sand Molding Area, Behind the Scenes at the Right, and the Dry Sand Molding Area, Located Similarly at the Left. Cores are made in this room and passed directly into the ovens

Investigation of Defects in Extruded Metals

Origin and Remedy Discussed by British Institute of Metals—Testing Light Specimens with the Scleroscope—Age-hardening of Aluminum Alloys

(Special Correspondence.)

LONDON, Sept. 26.—The opening session of the autumn meeting of the British Institute of Metals at Birmingham has already been reported in *THE IRON AGE*. The present report deals with the second day's session on Sept. 22.

At a lunch given the members by the Metal Trades Associations, Sir George Goodwin, in responding to a toast, observed that there had been a good deal of standardization in the metal industries in recent years, especially in the United States. There was no doubt that this did cheapen manufacture, but it also introduced a tendency to stagnation. On his various visits to Birmingham he had found a good deal of standardization, but he had also found that the works were adaptable to meet all the exacting requirements of the Royal Navy. He then referred to the necessity for continued research work and for adequate remuneration for those who undertook it. The recently-formed Non-Ferrous Metals Research Association would provide a useful link between the institute and the non-ferrous metal trades.

The question of industrial research was also raised later in the day when Principal C. Grant Robertson welcomed the institute on a visit of inspection to Birmingham University. Principal Robertson said the university meant business, and in two senses. It provided professional training for industrial careers and it provided for research. It had recently set up a standing joint committee on research (and he believed this was the first of its kind) to co-ordinate the research work of the university in relation to the local industries, which would have representatives on the committee.

At the second business session on Sept. 22, the following papers were taken:

The Extrusion Defect

Under this title, R. Geuders presented a communication from the Research Department, Woolwich. He observed:

Although the possibility of extruding soft metals such as lead and tin had been established as early as about 1800, the process was not successfully applied to copper alloy until it was shown by Alexander Dick, during the 'eighties, that delta metal could be extruded in a heated state. The hot extrusion process, as is well known, consists in the pressing of metal heated to a plastic state, through a die, so that a continuous bar of the cross-section of the die is produced. In the process, as generally carried out, a cast billet, reheated, in the case of 60:40 brass, to a temperature of about 800 deg. C., is placed in a receiver having a fixed die at one end. A plunger actuated by a hydraulic press is inserted. As the plunger moves forward the brass is extruded through the die. The advantages of the process are well recognized. The available literature on the subject is scanty and mainly devoted to the design of the apparatus rather than to the behavior of the metal during the process.

It is found that when solid rod is extruded from a central die, the last 25 or 30 per cent of rod to leave the die contains a characteristic defect peculiar to extruded rod. Transverse sections show a more or less complete circle, varying in diameter at different positions along the rod, consisting of oxide and foreign matter inclosed in partially dezincified brass. The core inside the circle has generally the same structure as the sound metal outside. When a defective rod is broken across, the core frequently breaks at a different point from the outer ring and projects, and is sometimes quite loose. The defect may not be completely continuous either longitudinally or circumferentially, and it is possible for a badly defective rod to show an end fracture which is not visibly unsound. The defect is commonly known by the misleading term "piping," and has often been

ascribed to ingot defects. The sole fact that it occurs regularly in the same form in each rod produced by central extrusion is sufficient, however, to discount this assumption.

The mode of formation of the defect was investigated by the examination of billets extruded to various stages. The specimens were sectioned axially and pickled in 50 per cent nitric acid. It is found in such specimens that the foreign matter and dezincified metal similar to that dividing the core from the outer ring in the bar is present in the partially extruded billet in the form of a funnel. The mouth of the funnel is the edge of the rear end of the billet, and the neck of the funnel is continuous with the tubular defect in the extruded rod, while the metal within the funnel is sound. The occurrence of the defect in this form can be explained as follows: When the heated billet is placed in the relatively cool receiver and expanded into close contact by the first pressure of the ram, the outer surface is chilled and becomes less plastic than the interior. The plastic interior flows easily through the die, but the stiffer outer shell cannot flow so readily, and the friction between the bore of the receiver and the surface of the billet also tends to prevent the skin of the billet from flowing. Consequently the cylindrical skin of the billet, which must shorten as the billet becomes smaller, is bent over inward to be carried forward by the flow of the metal toward the die. The actual defect, thus appears to consist of the dirty, oxidized skin of the original billet, and, if formed in the manner suggested above, would be expected to take a path identical with the outline of the defect found in the sectioned billets.

The formation of the defect in this manner explains its occurrence in the rear-most portion of the extruded rod. It is clear that the skin of the billet at its extreme rear end could not enter the die before the reduction in length of the billet well exceeded 50 per cent. It would appear that the defect is present in the rear portion of all rod centrally extruded by the usual methods, but in rod of smaller diameter the foreign matter may be distributed over such a great length as to render it discontinuous and invisible in the fracture. In many cases the section of a partially extruded billet shows much more foreign matter on one side of the funnel formation than on the other, and in many sections of bar the circle of defective material is incomplete. This can be accounted for by assuming that the ram has not been concentric with the receiver, moving along nearer to one side than the other and thus largely missing the billet skin for a portion of the circumference. The author's explanation of the formation of the defect agrees with the conclusion arrived at by A. E. and P. A. Tucker.* In a paper read before the Birmingham Metallurgical Society on March 13, 1919, that the defect was a mechanical issue of extrusion, but gives no support to their suggestion that segregation and the crystalline structure of the billet are factors affecting the occurrence of the defect.

The author then considered various possible remedial methods. Regarding the suggestion to avoid relative movement of the receiver and billet, he observed that this is based on the theory that the skin of the billet refuses to flow along the bore of the receiver, and is bent inward by the forward motion of the ram. It could only be put into operation by substantial modification of the usual type of plant. By inverting the process so that the die is pushed into the metal on the end of the ram, the flow of metal would take place near the die and the skin of the billet at the end farthest away would not be affected, the relative movement being solely between the die and the receiver. It might be possible to extrude both ends at once. This method was patented several years ago, but was devised with the object of obtaining more regular properties in the rod by extruding the middle portion of the billet (which is away from the cooling influence of the die and ram) last. A somewhat more practicable method, however, is to carry the die on the end of a hollow ram or to allow the receiver to move

**Iron and Coal Trades Review*, March 21, 1919.

forward with the ram, the die being held on a fixed hollow shaft.

It might be objected, however, that the effect of pushing the die into the container, which with the billet remains stationary, would be to turn over the skin of the billet at the die end and allow it to flow into the extruded rod from another point. The turning inward of the skin at the external edge of the die would undoubtedly occur, but the defective material would accumulate in a region from which smooth flow through the die would be difficult. The author's experiments confirm this view.

Experiments were carried out in small scale apparatus. (1) with solid ram and relative movement between billet and container, as in present practice, and, (2) with hollow ram, and no relative movement between billet and container. The results obtained on a small scale with the first apparatus appeared comparable in every respect with those obtained in manufacturing practice, while with the second apparatus the crystalline structure of the billet shows the effects of work only in the region just forward of the die, and the dirty skin of the billet is gathered on the underface of the die, where the metal appears to remain practically "dead" until the rest of the billet has been extruded. In complete extrusions the rod produced was sound from end to end. In some cases a little of the foreign matter was extruded on the outer surface of the last 4 or 5 per cent of rod.

The method has not so far, to the author's knowledge, been used for the hot extrusion of copper alloys, and it is suggested that its undoubted advantages merit some consideration in this respect. The power required is less than with the method at present in use, and thus the process would require a lighter receiver or would be less likely to bulge those of the present type. The necessary modifications of the plant would probably be fully justified by the saving of the very large amount of metal, which by the present method is extruded only to be ultimately scrapped.

Discussion

R. J. Redding, Birmingham, speaking as a user of extruded bars, said the subject was most important. During the war the amount of the defects increased, possibly due to using larger billets, working at higher speed, and using more of the bar. He had conducted extrusion experiments with wax models dyed red on the outside which had given practically the same results as those recorded in the paper.

Dr. Rosenhain said they had found at the National Physical Laboratory that some alloys could only be worked after extrusion. They had soon come across the same defect, and had experimented with model billets of plasticine made up of alternate layers differently colored, as a result of which they had to a great extent got over the difficulties. He did not agree that the central defect was due to the external skin, and thought the author had too lightly ignored the question of defects in the ingot.

Harold Moore, Woolwich, agreed entirely with the paper and disagreed with Dr. Rosenhain's suggestion regarding ingot defects. Earlier researches at Woolwich in 1914-15 had shown that this was out of the question. It was very difficult to extract information from the makers of extruded rod. The defect did not occur to anything like the same extent when the multiple die was used.

Sir George Goodwin asked representatives of the manufacturers to give their views, but there was no response, and the author then observed that it was regrettable that no manufacturers had come forward. This made the meetings seem one-sided. Research workers carried out experiments and published information, but could get neither criticism nor opinions from the manufacturers to whom the work was presumably of value. He thought Dr. Rosenhain's experiments did not illustrate the effect of flow as it actually took place in brass. Sir George Goodwin then added that, in the case of a paper like the present, the manufacturers owed a duty to the institute to take part in the discussion.

Fred S. Tritton, of the National Physical Labora-

tory, introduced a paper entitled "The Use of the Scleroscope on Light Specimens of Metals."

The author referred to the doubt as to whether the real hardness values of small samples were obtained, although the usual precautions were taken to support the specimens in an apparently rigid manner. Various tests confirmed these doubts, and new means of support for the specimen were tried. Success was obtained by using pitch between the specimen and support but the usual clamp was found unsatisfactory. A new clamp designed by Dr. Rosenhain overcame the disadvantages and is described in the paper. A later improvement was the use of glucose in place of pitch, the ordinary liquid commercial variety being used, with a specific gravity of 1.425.

Discussion

Sir T. K. Rose commended the method, and referred to his own experiences with light samples at the Royal Mint. Capt. John Cartland, Ashton-on-Mersey, asked why a higher value was obtained with copper grips than with steel grips. Dr. W. H. Hatfield, Sheffield, said he regarded the Brinell test as the most reliable where it was applicable, but in other cases the scleroscope was very useful. In some of his own experiments he had found that with a support one inch thick he got a scleroscope hardness of 96, whereas with a support only 0.1 in. thick he got 76. He supported the author's results and statements, especially as regards unreliable scleroscope results given in some scientific papers.

H. L. Heathcote, Birmingham, related some experiments on steel balls at the Rudge-Whitworth Research Laboratory, as a result of which he obtained a curve of every irregular shape, something like a Greek letter, the name of which he had forgotten. Dr. A. G. C. Gwyer said that in testing thin sheet the value for the same temper was greatly dependent on the thickness of the sheet. He had several scleroscopes, and none of them read the same on the same material. He had recently bought two new hammers, which differed in weight by 10 per cent, and in readings by 100. Mr. Tritton, in the course of his reply, said that the higher values obtained with the copper grips were due to their giving a higher rebound.

Age-Hardening

An exhaustive research, of considerable value, by Dr. D. Hanson and Miss Marie L. V. Gayler, M.Sc., of the National Physical Laboratory, bears the title "The Constitution and Age-Hardening of the Alloys of Aluminum With Magnesium and Silicon." It was introduced and very clearly summarized by Miss Gayler and, in the discussion, Professor Desch said it was quite a pleasure to see photo-micrographs which do really represent what they are intended to represent and do not require the exercise of faith. H. B. Weeks said the work was of more than academic interest, and important developments should follow the correlation of age-hardening properties and constitution.

Other papers presented to the meeting were: "The Relation Between the Mechanical Properties and Microstructure in Pure Rolled Zinc," by D. H. Ingall, Birmingham; "The Electrolytic Etching of Metals," by Frank Adcock, Ipswich, and "The Magnesium Alloy Electron," by S. Beckinsale, Woolwich.

On page 793 of THE IRON AGE, Sept. 29, in the description of the new Ford foundry at River Rouge, Mich., the 3-ton electric furnace is stated to have been of the single-phase type, with two electrodes. We are now informed by the Electric Furnace Construction Co., Philadelphia, which supplied the furnace, that it is a 3-phase 4-electrode Greaves-Etchells furnace.

The Youngstown Steel Car Co., Niles, Ohio, has booked an additional order from the New York Central Railroad for the repair of 500 freight cars, and now has 1900 cars on its books. An official states that business definitely in hand insures capacity operations until April 1 next. In addition, other important business is being negotiated.

Cost of Rolling Steel in Blooming Mills*

Discussion of Electric Drive Compared with Steam-Driven Units—Cost Comparisons on Basis of Tonnage Rolled Favor Electric Operation

—BY G. E. STOLTZ†—

ENGINEERS to-day are vitally interested in the economy to be obtained by replacing the existing steam units of rolling mills by electric drive. The field of motor application has been divided into two parts; the auxiliaries and the main drive, and the advantages which apply to either of these fields apply to the other, but not in the same degree.

Experience has shown that a greater saving is to be obtained by replacing the steam units on the auxiliaries than on the main rolls. The economy of small engines is relatively poor when compared with that obtained on the large engines. In addition to this, the losses incidental to a network of small steam lines contributed to the replacement of engine drives in this field.

Development of Mill Type Motors

Electric drive was adopted, even before motors were developed which might be considered entirely suitable for such applications. The advantages were so greatly in favor of electric drive that motors which had been designed for railroad work were adopted, but the demand soon became large enough to warrant the manufacture of the mill type motor, which is just as special for steel mill work as the railroad motor is for railroad work. The elimination of engine drive on auxiliaries might be considered as the completion of the first step in steel mill electrification, and the fact that this movement has been so rapid and universal must signify there were other important results gained in addition to economy.

Power for the auxiliary motors was generated by engine-driven units in sizes comparable to the engines driving the main rolls. These engines were usually located near a boiler room, so that the losses in the steam line were considerably less than would be obtained in a network of lines to small engines, and the engines driving the generators were naturally larger than those which would be used for the auxiliaries, so that much better economies were obtained. In addition to this, the engine driving the electric generator took advantage of the diversity of demand on the individual units, so that its load varied over the small range in capacity where its best economy is obtained.

The engines on the main rolls were quite often placed near the boiler plant, and being of the same general capacity as the prime movers then used to generate electric power, no great difference in economy existed. Improvements were made on the main roll drives by installing compound condensing engines, and later in some cases low pressure turbines were installed, to utilize the exhaust steam and obtain a greater vacuum than is possible with an engine.

New Power Units Favor Motor Drive

In the decade of 1900 to 1910 two new methods of generating electric power in steel plants came into prominence; the gas engine and the high pressure steam turbine. This greatly changed the situation, as an improvement in economy could now be obtained by electrifying the main rolls, just as was formerly obtained by placing motors on the auxiliaries. Some very extensive main roll electrifications were made on the basis of producing power, in some cases with gas engine driven generators, and in others with high pressure turbo-generators.

Even if the gas engine and the high pressure turbine had not been improved since the installation of the

first units, the growth of electrification would, I believe, have been substantial, but would by no means be as rapid as it has been during the intervening years. However, both gas engines and steam turbines are now being built in increasing sizes and better economies are being obtained. The steam turbine has led in the race, and the economies now obtained have contributed more to electrification in steel plants than any other one item.

Operating engineers to-day are interested in the question of replacing the steam units now in operation. Much interest has been aroused by the fact that already a number of important electric installations have been made to replace the steam engine. While in some cases the engine has been replaced, due to the fact that it was worn out, there are several cases where the change was made to obtain better economy, and to be able to produce the steel cheaper than was possible with the steam unit.

Effect of Motor Drive on Cost

While there are a number of factors to be considered, the cost of rolling steel must first be disposed of. It is therefore necessary to determine first the cost of rolling steel on the steam unit in operation, and then estimate the cost of rolling steel if a motor were installed. Mr. Jefferies* has published costs of rolling steel on his 34-in. reversing blooming mill, first in an article in the 1916 volume of the Proceedings of this association, and later in the February, 1920, monthly proceedings of the association, with the discussion of "Steam vs. Electric Drive." At the same time, Mr. Siebert presented some valuable data on this same subject.

In his discussion, Mr. Siebert compares the effective work of the various types of engines, and shows that what the compound engines gain in engine economy is partially lost in greater acceleration and friction losses. In Fig. 9 of his discussion he plots a curve, giving the kw.hr. consumption per ton of steel rolled for various elongations. The curve here appended has been taken from this data, the points establishing the upper curve being taken from Fig. 11, and the lower curve from Fig. 9, of Mr. Siebert's paper.

Mr. Siebert plotted the latter curve in kw.hr. per ton, but we have expressed the same values in lb. of steam per ton, assuming that 16 lb. of steam are required to generate a kw.hr. At this same meeting Mr. Eppelsheimer† presented a discussion giving test results on a 40-in. mill engine. This test lasted 17 hr. and certain boilers were set aside to serve the engine alone. The upper point taken from Mr. Eppelsheimer's data represents the total steam per ton rolled and the lower point the net steam charged to the engine after it is given credit for exhaust steam to a low pressure turbine. The data submitted by Mr. Siebert indicates that the steam-driven mill requires $2\frac{1}{4}$ times the steam that would be required for electric drive, and the net steam from Mr. Eppelsheimer's test is $3\frac{1}{2}$ times that required by electric drive.

Practical Operation the Only Criterion

These values, of course, represent results obtained from tests of relative short periods, while the requirements for electric drive are taken over monthly periods, which include incidental losses that become particularly prominent on steam engine drive when small tonnages are rolled. When these mills operate at a re-

*Abstract of paper read before Association of Iron and Steel Electrical Engineers, Philadelphia and Youngstown meetings.

†General engineer, Westinghouse Electric & Mfg. Co., East Pittsburgh, Pa.

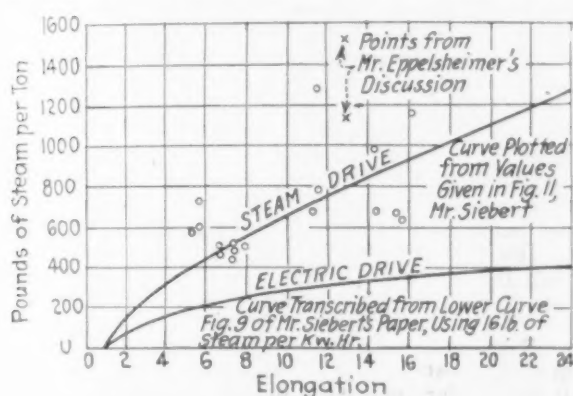
*Electrical superintendent, Steel Co. of Canada, Hamilton, Can.

†Chief engineer, American Rolling Mill Co., Middletown, Ohio.

duced tonnage, the ratio of steam consumption would be still larger, as the standby losses of the electric drive are not so great as those obtained with steam units.

The data referred to above as given by Mr. Jefferies cover seven years' record on his mill, and naturally are of more value than results obtained over short periods when the mill is operating at a fair tonnage. His figures include those incidental losses and costs which cannot be figured from test values, and for this reason are of great value to engineers making a study of this subject.

We believe if data of this character were submitted from various mills it would be easier to determine the time when an engine should be replaced by an electric motor, and for this reason we are submitting figures taken from several reversing blooming mills, both steam driven and electric driven. Naturally, the costs will vary somewhat with the product rolled and with the tonnage output, but an approximate indication of the



steel rolled is being given with the cost figures, so as to make it possible to compare the results with that on other mills.

The mills represented by items III and V in the table roll approximately the same product and are subject to the same method of accounting. The two mills have rolled the same maximum tonnage, although the demand for the product rolled on the electric driven mill has not been so regular as that of the steam

000. This would easily pay for electrifying mill No. V, including the necessary boiler and generating capacity, in 4½ years.

Discussion by R. B. Gebhardt*

At Sparrow's Point we have a 40-in. electric-driven blooming mill, which, I understand, is about second on tonnage record to any electric-driven mill in this country. Its record is 57,616 tons for a single month's operation, rolling partly slabs and partly 8 x 8-in. blooms. The following table gives figures, similar to those submitted by Mr. Stoltz, for this mill:

Months in operation	11
Average monthly tonnage	43,950
Average cost of operation:	
Electric power for roll drive	16.6c.
Repairs and maintenance	0.8c.
Miscellaneous supplies	0.1c.
Labor	0.2c.
All other cost	0.4c.
Total cost	18.1c.

In the figures presented by Mr. Stoltz there is no doubt left in our minds that, of the mills from which these were obtained, the electric drive shows an appreciable economy over the steam drive. However, someone might argue that these figures do not tell the whole story, as no fixed charges against the original investment are included, and it is the purpose of this discussion to approximate such charges for the benefit of any skeptical ones who need further convincing.

Referring back then to our proposed mill, the first costs with either method of drive would be about as follows:

	Steam Drive	Electric Drive
Boiler plant including connections up to engine	\$500,000	
Electric power plant including boilers, turbo units, wiring, etc., complete		\$660,000
Engine drive, twin tandem compound, with condenser	200,000	
Motor drive complete		450,000
Total	\$700,000	\$1,110,000

The fixed items chargeable against the above investment in either case may be taken as follows:

Interest on investment	6 per cent
Depreciation	6 per cent
Insurance, taxes and miscellaneous	3 per cent
Total	15 per cent

Reversing Blooming Mills	Electric Drive			Steam Drive		
	I	II	III	IV	V	VI
Size of mill	34-in.	35-in.	40-in.	35-in.	36-in.	40-in.
Size of ingots rolled	15x17 in.	20x20 in.	22x24 in.	18x20 in.	22x24 in.	18x20 in.
Weight of ingot	4200 lb.	6800 lb.	9600 lb.*	5500 lb.	9600 lb.	6000 lb.
Size of blooms rolled	8x8 in.	8x8 in.	6x6 in.	4x4 in.	8x8 in.	7x4 in.
	6x6 in.	4x4 in.	8x10 in.			
	4x4 in.	5½x22 in.				
Size of engine used†				42x60 in. geared	50x66 in.	55x60 in.
Years covered by figures	7	2	2	3	2	2
Months in operation	73	21	12	35	24	24
Average monthly tonnage‡	18,600	26,700	27,000	23,900	32,930	18,075
Average cost of operation:						
Kw.hr. per ton	21.2	21.3	19.6	.....	.....	.....
Lb. steam per ton .....	.....	.....	.....	1040	1690	2870
Cost for power	14.45c.	23.20c.	20.20c.	53.50c.	63.50c.	107.00c.
Repairs and maintenance	0.58c.	0.07c.	0.35c.	2.94c.	4.27c.	5.47c.
Miscellaneous supplies	0.30c.	0.14c.	.....	.....	.....	0.72c.
Operating labor	1.32c.	1.86c.	1.88c.	3.97c.	3.39c.	4.62c.
Total cost	16.65c.	25.27c.	22.43c.	61.41c.	71.16c.	117.81c.
Weighted averages:						
Cost for power		Electric			Steam	
Upkeep and supplies		19.83c.			70.81c.	
Operating labor		0.43c.			4.63c.	
		1.73c.			3.87c.	
Total		21.99c.			79.31c.	

*Also 25 x 25 in., 11,500 lb., and 25 x 30 in., 13,500 lb.

†All twin simple engines, exhausting into low-pressure turbines.

‡Tonnes and costs based on 2240-lb. per ton of finished product.

driven mill. The difference in cost on these two mills is 50c. per ton, which, on the basis of 30,000 tons per month, would result in an annual saving of \$180,- This would be, for steam drive, \$8,750 per month,

and for electric drive, \$13,875 per month, or a difference of \$5,125 per month, in favor of the steam drive. Assuming a monthly tonnage of 25,000 on either type

*Bethlehem Steel Co., Sparrow's Point, Md.

of mill, then fixed costs per ton would be \$0.35 on the steam driven mill and \$0.555 per ton on the electric driven mill. Adding these fixed charges, then, to the highest average electric costs given by Mr. Stoltz, and the lowest average steam costs, in order to be sure we are on the safe side, we have \$0.808 per ton for electric operation as against \$0.964 per ton for steam operation.

Discussion by B. A. Cornwell*

A few of the more important advantages of the large motor when compared with the steam engine for driving the main rolls are as follows:

1. More constant and regular torque.
2. Greater flexibility—meaning less breakage of pinions, couplings, etc.
3. Reduced space—due to the absence of boilers, steam piping, etc.
4. Reduced labor costs.
5. A lower fuel cost—due to the use of large blast furnace gas engines and to the good economies obtained by high pressure steam turbines.

Discussion by G. S. Warren†

The Sharon Steel Hoop Company has a 35-in. electric-driven blooming mill at its Lowellville plant, which has been in operation about two years. The operation has been very irregular, due to several causes, but we have found that, without any special tests, our kw.hr. will run from 20 to 22 per ton of steel rolled. We have been rolling 20 x 22-in. ingots to a maximum section of 15 x 4 in. and a minimum of 4 x 4 in. Our costs run somewhat higher than Mr. Stoltz shows in his tables, and are about 30c. per ton.

This mill has made 675 tons in a single 8-hr. turn. The mill has operated only 16 hr. any day, and this would tend to make our costs higher. We are limited by our heating capacity, having only four soaking pits to take care of this mill.

*Engineer, Electrical Department, Carnegie Steel Co., Ohio Works, Youngstown.

†Sharon Steel Hoop Co., Sharon, Pa.

Chicago Foundry Conditions

CHICAGO, Oct. 17.—In view of the varying opinions on the melt of foundries, it is refreshing to secure accurate statistics. In the month of August, 29 representative foundries in the Chicago district consumed 5956 tons of pig iron as against a normal monthly consumption of 14,630 tons. This would indicate an operating rate of about 41 per cent during the month. On Sept. 1, these melters had 22,372 tons of pig iron on hand, as compared with 23,996 tons on Aug. 1, or a reduction of 7 per cent. On the other hand, they still had 9924 tons due on contracts, as of Sept. 1, and this tonnage plus that in their yards on that date was equal to 220 per cent of their normal monthly consumption and 544 per cent of their August consumption. Iron purchased in August amounted to 5708 tons, or 96 per cent of the consumption during that month. Iron received totaled 3013 tons, or slightly more than one-half the melt in August.

Mahoning Valley Operations

YOUNGSTOWN, OHIO, Oct. 18.—There is as yet no perceptible decline in steel mill operations in the Mahoning Valley. Sheet production is well sustained, 77 units being under power this week, as compared with 76 last week. Nine pipe furnaces are fired as against eight the previous week. The Brier Hill Steel Co. is operating 18 sheet mills, Youngstown Sheet & Tube Co. 15 and Trumbull Steel Co. 13. Forty-one of the Valley's 66 open hearth furnaces are charged, including 31 independent furnaces.

The A. M. Byers Co., Pittsburgh, is operating its blast furnace, 72 puddle furnaces and skelp and bar mills at its Girard works.

At New Castle, Pa., the Carnegie Steel Co. has two furnaces in blast, and is operating its bessemer department and blooming and bar mills.

MORE ACTIVE STACKS

Jones & Laughlin Steel Co. Now Has Five Furnaces in Operation—Gains Elsewhere

The Jones & Laughlin Steel Co. recently turned on the blast at two furnaces, one at its Pittsburgh plant and one at its Woodlawn, Pa., works. The company now has 5 of its 12 furnaces making iron. Of the 140 blast furnaces, steel works and merchant in the territory bounded by Johnstown, Pa., Wheeling, W. Va., and Warren, Ohio, 42 now are in blast, or 30 per cent numerically figured. This is a gain of 16 furnaces from the low point reached around July 1, when only 25 stacks were blowing. Only four merchant stacks of a total of 21 are in blast. These are one furnace, American Manganese Mfg. Co., Dunbar, Pa.; the Mattie furnace, A. M. Byers Co., Girard, Ohio; Cherry Valley furnace, Hanna Furnace Co., Leetonia, Ohio, and No. 3 furnace, Shenango Furnace Co., Sharpsville, Pa. Active steel works stacks include one each at the Schoenberger Works, Pittsburgh, and the Donora Works, Donora, Pa., of the American Steel & Wire Co.; 1 furnace, Brier Hill Steel Co., Youngstown, Ohio; 17 furnaces, Carnegie Steel Co., Pittsburgh; 3 furnaces, Midvale Steel & Ordnance Co., Johnstown, Pa.; 5 furnaces, Jones & Laughlin Steel Co., Pittsburgh; 1 furnace, LaBelle Iron Works, Steubenville, Ohio; 1 furnace, Pittsburgh Steel Co., Monessen, Pa.; 2 furnaces, National Tube Co., Pittsburgh, one furnace, Republic Iron & Steel Co., Youngstown, Ohio; 1 furnace, Sharon Steel Hoop Co., Lowellville, Ohio; 1 furnace, Weirton Steel Co., Weirton, W. Va.; 1 furnace, Wheeling Steel & Iron Co., Wheeling, W. Va., and 2 furnaces, Youngstown Sheet & Tube Co., Youngstown, Ohio, a total of 37. It is reported that the Trumbull Cliffs Furnace Co., stack at Warren, Ohio, which will provide hot metal for the Trumbull Steel Co., will be blown in either Nov. 1 or Nov. 15. This is a new furnace and is jointly owned by the Cleveland-Cliffs Iron Co., Cleveland, and the Trumbull Steel Co., Warren, Ohio.

Inland Looks for 1922 Rail Demand

The decision of the Inland Steel Co. to install rail finishing equipment, as announced in THE IRON AGE of Oct. 13, was prompted by the belief that the demand for rails next year will be of large proportions. The company expects to be able to offer rails for delivery beginning in March, 1922. The 28-in. structural mill on which the rails will be rolled, has heretofore been used chiefly in the manufacture of heavy structural material, the demand for which in Chicago territory does not under present conditions engage the full capacity of the mill. The mill is three-high and has three stands of rolls and is served by a 32-in. roughing mill, which in turn is served by a 40-in. blooming mill, all motor driven. These mills were fully described in these columns on July 10 and 17, 1919. The rail finishing equipment will be housed in a large addition, referred to a week ago, which will be served by two 15-ton overhead traveling cranes. The work undertaken also involves the construction of four large heating furnaces in which the blooms will be reheated before rolling the rails, it being believed that a much better rail will thereby be produced than by the methods heretofore employed. With an estimated capacity of 2000 tons of finished rails per day, the Inland mill will stand second in output in the United States. The Inland company has been equipped for some time to furnish the fastenings that go with the rails, such as angle bars, tie plates, track spikes and track bolts.

Production and sales activities of the Pierce-Arrow Motor Car Co., Buffalo, which have been accelerating gradually during the last three months, have reached a schedule which is rapidly approaching normal. As a result, the factory is running full time with a force of 4230 workers. There is every prospect, according to company officials, that this force will be maintained, if not increased, during the next six months.

Gear Standardization at Rochester

Substantial Progress Featured Meeting Last Week
of American Gear Manufacturers' Association—
Several Design and Material Standards Approved

MEASURABLE progress in standardization marked the semi-annual meeting last week of the American Gear Manufacturers' Association. Specialized investigations had been carried on in the interval since the annual meeting in the spring in Cincinnati by numerous committees, and most of the reports of these committees bore evidence of the gradual formulation of standards which will have broad acceptance. Some standards were adopted as recommended practice.

Outstanding in the meeting were the definite steps taken by committees to work as the cases warrant with corresponding bodies of such organizations as the American Society for Testing Materials, the American Society of Mechanical Engineers, the Society of Automotive Engineers and the American Engineering Standards Committee. Also noteworthy was the degree of concentration given by the average participant to the questions under discussion, indicated in part by continued attendance; and though an association of manufacturers, the discussions were almost exclusively technical. Engineering topics necessarily were involved in considering the standards but, as it was emphasized, the association while working from a theoretical basis does not lose sight of the commercial. A departure was a printed program for each committee offered for modification or extension by the meeting and calculated not merely to get definite action from each committee but to correlate their work where there is overlapping or a classification or division under more than one head. The spirit of camaraderie among men who are more or less business competitors was as characteristic of the meeting as it has been of those from the beginning of the organization.

The meeting was held at the Powers Hotel, Rochester, N. Y. The deliberations were chiefly over the committee reports, requiring sessions on the afternoon and evening of Oct. 13, and the mornings of Oct. 14 and Oct. 15. Each session, however, was opened with the reading of a paper. One of these, by S. O. White, chief engineer Warner Gear Co., Muncie, Ind., described experiments on "Gear Tooth Wear." Another, by R. W. Daniels, Baush Machine Tool Co., Springfield, Mass., dealt with "Duralumin, as a Material for Worm and Other Gearing" and a third was by E. W. Miller, chief engineer Fellows Gear Shaper Co., Springfield, Vt., on "Tooth Forms." E. S. Sawtelle, assistant general manager Tool Steel Gear & Pinion Co., Cincinnati, on the evening session of Oct. 13, told of his experiences and observations in a recent trip through England, France, Switzerland, Holland and Germany. The meeting might in part be called a Gleason meeting, Rochester being the home of the Gleason Works and of the Gleason gear generators and James E. and Andrew C. Gleason acting as hosts on a number of occasions as told later in this account.

Business and Government Matters

Practically nothing was said of present general business conditions. In opening the meeting President F. W. Sinram, Van Dorn & Dutton Co., Cleveland, expressed himself as firmly of the belief that "We have reached the up-grade." The tariff matter was reviewed by S. L. Nicholson, Westinghouse Electric & Mfg. Co., and subsequently a resolution was passed to the effect that the tariff should be written to provide sufficient protection to cover the present conditions of business, of unemployment and of relations to other countries and also to incorporate in it the American valuation plan. It was ordered that copies of the resolution be put into the hands of the proper authorities in Washington. Incidentally it was pointed out that no longer is the tariff commission considered a

joke and men of large caliber are being sought for it.

The Department of Commerce came in for commendation in respect to its efforts to get frequent reliable production statistics from industrial groups and Secretary of Commerce Hoover was referred to as helping materially in fulfilling the Administration's promise to put more business in government and not the reverse. Those interested in the monthly analyses of the Department were referred to the Superintendent of Public Documents, Washington.

The burden of what was said on the labor factor was that hourly wage reductions must not be carried too far seeing that men are not working full time and their weekly incomes are thus commensurately out of line with the cost of living factor—thus impairing general purchasing power—and that employers need always to provide conditions which will kill the appeals of the unions. In short they must make the American plan attractive. The general belief in the prevalence of high wage rates, it was added, is so great that the buying public is waiting in part for the labor bubble to be punctured, and this fact complicates the situation.

The reports of Secretary-Treasurer Frank D. Hamlin, Earle Gear & Machine Co., Philadelphia, showed the association to be in a notably good condition financially and to have a membership of 92 member companies, with two more about to be added, 110 executive members and 59 associate members. President Sinram commented on the showing as reflecting the stability of the gear industry. Mention was made of the death of J. L. Larson, Foote Brothers Gear & Machine Co., the first death to occur in the ranks of the association, now five years old. It was also noted that the association is to have a foreign membership clause.

New members elected were the Central Products Co., Detroit, with J. W. Wilson, the executive member and H. B. Shoemaker, the associate; Harris Engineering Co., Bridgeport, Conn., with H. E. Harris the executive member; A. F. Boissoneau, William Ganschow Co., Chicago.

Differences in Cost Accounting

The first committee reports read had to do with the more general matters. Some reference has already been made to the reports on the tariff and industrial relations. For the publicity committee Chairman J. C. McQuiston, Westinghouse Electric & Mfg. Co., who was represented by F. B. Davis of the same company at Buffalo, emphasized the lack of use of the gear association emblem by a number of the members. The committee on uniform cost accounting, J. H. Dunn, R. D. Nuttall Co., chairman, reported on the results of a questionnaire sent to the membership.

Of 44 companies replying, 24 have adopted or favored the committee's classification of accounts but 18 had not. The machine hour rate of distributing the factory overhead expenses is used by 16 and one percentage of direct labor for the entire plant is used by 14. For distributing the administrative, general and selling expenses to costs 22 apply a percentage of the factory cost, while seven combine these expenses with the shop overhead and make the distribution as a percentage of the direct labor; seven did not answer the question. One company charges factory expenses with interest on investment in equipment at 6 per cent. Special tools and patterns are handled very irregularly; such expenses are going variously into capital accounts, factory overhead and direct to job.

The committee agreed that one inflexible system of cost distribution will not meet the requirements of all member companies. "The shops that are using one percentage of direct labor for their entire plants are securing very inaccurate costs unless their factory



MEMBERS OF AMERICAN GEAR MANUFACTURERS' ASSOCIATION ASSEMBLED IN

equipment consists of units that are equally expensive to operate or else all the production goes over the same machines; that is also true when one machine rate for the entire plant is used. The shop overhead expenses should be distributed to machines, groups of machines or manufacturing departments." There is apparently no reason, the report continues, "why such expenses as special tools and patterns should not be charged direct to the job for which they are made or purchased.

"The basis for distributing commercial expenses is also a matter that should readily be standardized. Your committee recommended that such expenses be distributed on a percentage of factory cost basis. The various methods now in use produce important differences in the commercial cost arrived at by different plants, even if the manufacturing cost were actually the same in each plant." The committee is considering the appointment of sub-committees for different classes of manufacturers, such as automotive gears, railroad gears and general industrial gears.

As explaining the relatively small percentage of replies received by the committee, President Sinram suggested that many concerns are running as light as possible, minimizing overhead expenses and that as industry approaches more nearly the normal the need of considering cost accounting more closely will become apparent.

Programs for Standardization Committees

The formulation of programs for steering the numerous technical standardization committees and their presentation to the meeting for discussion was a feature of the convention. These were practically all printed in advance and offered in pamphlet form. The object was explained as affording a means of co-operation between members of several committees and of securing aid from members of the association. The association emphatically placed itself on record that it is not an engineering society but that research is proper and will be pushed as far as may be for the benefit of the members as manufacturers.

An idea of the form and substance of the standardization programs may be gained from the reprinting below of that of the spur gear committee, and a further idea of the interdependence of committee actions in relation to the general standardization committee, of which each is in reality a sub-committee, may be obtained from the following, "foreword to sub-committees."

The various committee programs are, in some points, peculiar to the type of gear; at the same time many of the items listed are applicable to each and every type, and each committee should bear in mind, in offering a recommended practice, or a standard, that its relation to other types must have been

1—President F. W. Sinram, Van Dorn & Dutton Co., Cleveland. 2—Secretary-Treasurer Frank D. Hamlin, Earle Gear & Machine Co., Philadelphia. 3—First Vice-president R. P. Johnson, Warner Gear Co., Muncie, Ind. 4—Second Vice-President B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, chairman general standardization committee. 5—Henry E. Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J., member of executive committee and chairman of public policy committee. 6—F. B. Davis, Westinghouse Electric & Mfg. Co., Buffalo, in charge of publicity. 7—J. H. Dunn, R. D. Nuttall Co., Pittsburgh, chairman uniform cost accounting committee. 8—C. F. Goedke, William Ganschow Co., Chicago, chairman of entertainment committee. 9—W. H. Diefendorf, Diefendorf Gear Corporation, Syracuse, N. Y., member of executive committee. 10—John B. Foote, Foote Brothers Gear & Machine Co., Chicago, member of executive committee and chairman industrial relations committee. 11—A. F. Cooke, Fawcett Machine Co., Pittsburgh, member of executive committee and chairman herringbone gear committee. 12—James E. Gleason, Gleason Works, Rochester, N. Y., chairman of the legal and metric committees. 13—George L. Markland, Jr., Philadelphia Gear Works, Philadelphia, member of executive committee and chairman membership committee. 14—F. E. McMullen, Gleason Works, chairman bevel gear committee. 15—Andrew C. Gleason, Gleason Works. 16—C. E. Crofoot, Crofoot Gear Works, Inc., Boston, member of executive committee and chairman commercial standardization committee. 17—C. B. Hamilton, Jr.,

considered, and nothing inimical to the other type should be offered. Also, all methods of manufacture should be considered; otherwise manufacturing difficulties will hinder the adoption by all makers or users. Co-operation between the different committees will prevent this, and also repetition of efforts. Committees will find it helpful to co-operate with other engineering organizations having committees working on similar subjects.

Standardization Program of the Spur Gear Committee

1. Nomenclature and symbols in conjunction with the nomenclature committee.
2. Preparation of a standard spur gear for general industrial use, by means of a diagrammatic illustration of various types of spur gears, including a spoked wheel, a webbed wheel and a solid pinion, with proper formulas covering width of face, rim, arm proportions, hub proportions in conjunction with the other committees.
3. Develop general horsepower formulas with the view to developing tables for horsepower.
4. Investigate allowable stresses for A. G. M. A. materials in connection with the metallurgical committee.
5. Arrange means for communication with general membership for the purpose of gear installations (using standard chart for the purpose) with investigation as to causes and effects, and classify the results of such investigations, to determine the proper design of gear sets and gear mountings under various conditions.
6. Standardize automotive spur gears, as to tooth forms, form of blank, horsepower, wear of teeth, method of mounting, stiffness of shafts, clearance, materials, tolerances, lubrication, etc.



FRONT OF THE PLANT OF THE GLEASON WORKS, ROCHESTER, N. Y., OCT. 14

Hamilton Gear & Machine Co., Toronto, Ont., chairman of metallurgical committee. 18—S. L. Nicholson, Westinghouse Electric & Mfg. Co., Pittsburgh, chairman of tariff committee. 19—F. G. Eppley, Albaugh-Dover Co., Chicago, chairman of inspection committee. 20—E. J. Frost, Frost Gear & Forge Co., Jackson, Mich., member of executive committee. 21—C. R. Weiss, Link-Belt Co., Philadelphia, chairman of sprocket committee. 22—S. O. White, Warner Gear Co., Muncie, Ind., author of paper on tooth gear wear and chairman of differential gear committee. 23—Frank Burgess, Boston Gear Works, Boston, former member of executive committee. 24—E. W. Miller, Fellows Gear Shaper Co., Springfield, Vt., author of paper on tooth forms. 25—Frank E. Eberhardt, Newark Gear Cutting Machine Co., chairman of spur gear and nomenclature committees. 26—Frank Horsburgh, Horsburgh & Scott Co., Cleveland, first treasurer of the association. 27—A. W. Copland, Detroit Gear & Machine Co., Detroit, chairman of transmission committee. 28—Henry J. Eberhardt, Newark Gear Cutting Machine Co., chairman of tooth form committee. 29—W. H. Phillips, R. D. Nuttall Co., Pittsburgh, chairman of electric railroad and mine gears committee. 30—R. W. Daniels, Baugh Machine Tool Co., Springfield, Mass., author of paper on duralumin. 31—L. G. Nilson, Nilson-Miller Co., Hoboken, N. J., chairman of keyway committee. 32—J. C. O'Brien, Pittsburgh Gear & Machine Co., Pittsburgh, chairman of worm gear committee. 33—E. W. Sawtelle, Tool Steel Gear & Pinion Co., Cincinnati, who addressed the meeting on European conditions.

7. Work with committee on tooth form to standardize spur gear tooth forms.
8. Inspection in conjunction with the inspection committee.

Work With American Standards Committee

The technical standardization work was taken up committee by committee. The first report was on the co-operation with the American Engineering Standards Committee made by B. F. Waterman, Brown & Sharpe Mfg. Co., Providence, chairman of the gear association's general standardization committee. The gear makers and the American Society of Mechanical Engineers are sponsors under the workings of the A. E. S. C., and an organization was effected for the promulgation of American gear standards at a meeting in New York with Mr. Waterman as chairman, Earle Buckingham, Pratt & Whitney Co., vice-chairman, and John P. Kottcamp, Pratt Institute, Brooklyn, as secretary. A survey is being made of the standardization work in progress all over the industrial world and the Canadian Engineering Standards Committee was invited to attend the meetings of the super or central body.

The sub-committees reporting progress included the following: Spur gears, Frank E. Eberhardt, Newark Gear Cutting Machine Co., Newark, N. J., chairman; nomenclature, Frank E. Eberhardt, chairman; worms and worm gears, J. C. O'Brien, Pittsburgh Gear & Machine Co., Pittsburgh, chairman; Keyways, L. G. Nilson, Nilson-Miller Co., Hoboken, N. J., chairman; differential gearing, S. O. White, Warner Gear Co., Muncie, Ind., chairman; transmission gears, A. W.

Copland, Detroit Gear & Machine Co., Detroit, chairman, and tooth forms, Henry J. Eberhardt, Newark Gear Cutting Machine Co., chairman.

Railroad Gear Standards Recommended

The sub-committee on gearing for electric railroads and mines, W. H. Phillips, R. D. Nuttall Co., Pittsburgh, chairman, obtained acceptance by the meeting of specifications conforming to those of the American Electric Railway Association and covering case hardened forged steel gears, quenched and tempered forged carbon steel gears, case hardened forged steel pinions and quenched and tempered forged carbon steel pinions.

To Measure Gear Noises

The sub-committee on inspection, F. G. Eppley, Albaugh-Dover Co., Chicago, chairman, advised members to study the report of the National Screw Thread Commission, now obtainable as bulletin 42 of the Bureau of Standards. Mr. Eppley has addressed a letter to manufacturers of hobs and gear cutters asking for aid in the matter of inspection methods and information on the degree of accuracy maintained and commercial considerations in that connection. His committee is also attempting to calibrate gear noises and is seeking to find among makers of such instruments as phonographs if practical devices for sound measurement are available.

The sprocket sub-committee, through its chairman, C. R. Weiss, Link-Belt Co., Philadelphia, referred to the recommended practices growing out of mutual agreement with committees of the automotive and mechanical engineering societies and published in the September journal of the American Society of Mechanical Engineers. Maximum speeds of chains, sprocket, etc., have had the attention of the committee.

The report of the bevel and spiral gear committee, F. E. McMullen, Gleason Works, Rochester, N. Y., chairman, covered the preliminary description of a standard with a shortened tooth, involving reduced time for manufacture, increased rolling action and minimum sliding action.

Advance in Herringbone Gear Design

The herringbone gear sub-committee, A. F. Cooke, Fawcett Machine Co., Pittsburgh, chairman, obtained acceptance by the association of a recommended practice providing for tooth calculation on the basis of diametral pitch in the plane of rotation. Considerable discussion marked the reception of the report and it was brought out that the committee has yet to submit recommendations to make it possible for gear makers to use certain standard stock hobs in cutting according to the new standard. Accordingly the herringbone practice voted appears as something not

likely to be broadly followed until remaining portions of the committee's standardization program are completed, but it was approved as "a step in the right direction."

Gear Material Standards

Besides offering its program of future activity, the metallurgical standardization sub-committee, C. B. Hamilton, Jr., Hamilton Gear & Machine Co., Toronto, Ont., chairman, made suggestions for recommended practice which were accepted by the association after minor changes in the case of gear steels. Briefly put the practices harmonize with those of the Society of Automotive Engineers and the American Society for Testing Materials. For example, the first item accepted was that for screw stock, to be the standard of the S. A. E. or the A. S. T. M., explained as substantially identical. Certain S. A. E. specifications for bronze and brass were likewise accepted. These included what is known as S. A. E. No. 62 for hard cast bronze spur and bevel gears, Nos. 65 and 63 for worm gears and No. 64 for phosphor bronze for bushings. For steel castings the A. S. T. M. specification A-27-21 was adopted with the modification that "all gear castings must be properly annealed" and with, of course, the elimination of paragraphs applying only to ship and railroad castings.

In respect to specifications for rolled forged steel for gears, the report of the committee and the ensuing discussion developed a positive intention of working with the iron and steel division of the Society of Automotive Engineers and it brought out also the imminence of some revamping of S. A. E. specifications which the A. G. M. A. specifications have anticipated to some extent. For example A. G. M. A. 1030 steel, calling for 0.25 to 0.35 per cent carbon is now to conform with S. A. E. 1030 with a phosphorus limit of 0.045 per cent if the steel is to have heat treatment, but provision is to be made for higher sulphur and phosphorus limits, to agree with the A. S. T. M. steel castings specification, if no heat treatment is to be given to the steel. Such a steel is of course cheaper. Steel No. 2350 of the gear manufacturers' standards was eliminated as no such steel is ordinarily made and no one expressed a need for it.

Demand of 0.18 to 0.23 Carbon Gear Steel

Much of the discussion arose over the 1020 steel, calling among other things for 0.15 to 0.25 per cent carbon and 0.30 to 0.60 per cent manganese. E. J. Frost, Frost Gear & Forge Co., Jackson, Mich., pointed out the possibility of trouble in treating a steel running toward the upper limits in both elements and he felt that perhaps the carbon limits should be narrowed to 0.18 to 0.23 per cent. W. H. Diefendorf, Diefendorf Gear Corporation, Syracuse, N. Y., after the belief had been expressed that steel makers had undoubtedly dominated when the S. A. E. specification was adopted, told how one need merely "select the billets you wish to use in buying" and the necessary protection follows. Mr. Frost added that where, as in his case, he has the protection of material analyses at his own plant, the point is not necessarily important but many gear makers have no facilities for making analyses, and a suggestion he then made was approved that the association's chart of steels should contain a footnote warning of the danger of the simultaneous extremes in carbon and manganese. C. E. Crofoot, Crofoot Gear Works, Inc., Hyde Park, Boston, advanced the argument against changing the limits, or attempting a new standard providing for a smaller range in percentages, that the steel makers have learned to keep the sulphur and phosphorus low in the 1020 steel. Finally it was agreed that a 0.10 to 0.20 per cent carbon steel be provided for to take care of gears of the smaller sections, this to be No. 1015 and identical except for the carbon content with No. 1020.

As illustrating the sentiment that the gear association should work closely with the automotive engineers, the meeting favored a suggestion offered by W. C. Peterson, Packard Motor Car Co., that two members of the association's metallurgical committee be members of the iron and steel division of the Society of Automotive Engineers.

The standardization program of the metallurgical committee as offered to the meeting is here reprinted. It was extended at the meeting to include the determination of carbon by the spark test, Chairman Hamilton saying that the subject would likely be covered by a paper. Item 24 was the subject of the paper by S. O. White, reviewed elsewhere in this account, and the chairman added that a paper was in progress on the topic of item 19. It was agreed to consider under item 4 the specification of a special analysis gray iron or semi-steel for worm gear service and to study what is known as steel No. 2115 made, for example, by the Central Steel Co. and analyzing 0.12 to 0.17 per cent carbon, 0.40 to 0.60 per cent nickel, 0.30 to 0.50 manganese and 0.04 per cent sulphur and oil quenched.

Standardization Program of the Metallurgical Committee

1. Carbon and alloy steel specifications—Chemical and physical.
2. Non-ferrous alloy specifications for the following purposes:
 - Bronze for spur and bevel gears.
 - Bronze for worm gears.
 - Bronze for bushings.
 - Brass for flanges of composition gears.
3. Steel casting specifications—Chemical and physical in several carbon ranges for steels, for use in case hardened, heat-treated or untreated state.
4. Gray iron casting specifications—For gears only.
5. Specifications of hardness limits which will be acceptable when purchasing bars, forgings or castings of various chemical specifications.
6. Consideration of burnt or badly overheated forgings.
7. Recommended practice as to the hardening of hubs and bores to take ball and roller bearings.
8. Recommended practice as to the combining of two gears or a gear and a clutch, in one piece.
9. Recommended practice as to under-cuts and reliefs to clear grinding wheels, and on the use of fillets and elimination of sharp corners; on the prevention of hardening trouble arising from keyways and oil holes; and on obtaining clean threaded holes in hardened work.
10. Recommended practice as to the hardening of bores and fork grooves of gears which slide on splined shafts.
11. Recommended practice as to the prevention or control of shrinkage and warping in hardening.
12. A report on methods of preventing scale, especially hard and adherent scale.
13. A report on the economic factors governing the choice of:
 1. Bar stock.
 2. Open hammer forgings.
 3. Drop forgings.
 4. Upsetter forgings.
14. Recommended practice for the inspection of forgings and castings; consideration of defects which call for rejection and those which call for a rebate.
15. Recommended practice as to recording of heat numbers and the stamping of same on gears to give the maximum of information without excessive complexity; proposal of standard A. G. M. A. system.
16. A report on the design, construction and operation of furnaces for the heat treatment of gears.
17. A report on pyrometry as applied to the gear industry, with recommendations.
18. A report on microscopic examination of metals, as applied to the gear industry, with recommendations.
19. A report on the testing of hardness.
20. Recommended practice on the selection, test and use of carbonizing materials, and the design and use of carbonizing pots.
21. Recommended practice on "local" hardening as applied to gear work:
 - (a) Local carbonizing.
 - (b) Local heating.
 - (c) Local quenching.
22. A report on quenching mediums and quenching apparatus.
23. Recommended practice as to depth of case hardening for different classes of gear work, giving consideration to the kind of steel, the tooth dimensions and the hardness.
24. A report on researches on the relation of durability and wear of gears to hardness and other factors.
25. Recommendations for a standard nomenclature.

Conditions of Contracts

The report of the commercial standardization committee, C. E. Crofoot, Crofoot Gear Works, Inc., Hyde Park, Boston, chairman, was presented beyond the time for the scheduled close of the convention. Some question arose as to whether or not members were using in contracts or acknowledgments of orders the committee's stipulations covering the contractual conditions, and President Sinram said that through the executive

committee an effort would be made to ascertain what are the reasons for not using them.

The report of the meeting would perhaps not be complete without a reference to the spirit of levity which was now and then unexpectedly injected into the meeting at times of more or less intense concentration on a technical topic. These periods of momentary relaxation seemed to be thoroughly enjoyed and suggest the need of other associations' educating a President Sinram, a Secretary Hamlin, a George Markland or a W. H. Diefendorf to provide the means of meeting the fatigue factor. Commonly the interruptions began as an apparently serious contribution to the subject under discussion but sometimes they were without such finesse.

Tests of Gear Wear

The paper presented by S. O. White, chief engineer Warner Gear Co., Muncie, Ind., was prepared by E. R. Ross, experimental engineer of the company. It covered in part the description of the testing rig at the Warner plant as utilized to measure gear tooth wear, affording an opportunity to compare wearing qualities of various steels as well as the efficiency of gear power transmission. The wear tests reported on were made of the second speed gears of automobile transmissions and the testing equipment included a Sprague dynamometer for measuring input and another one for measuring the load transmitted, the difference being the friction loss. On the tests forming the subject of the paper 50 hp. was applied continuously for 6 hr. and the transmission being that used in passenger automobiles or light trucks, the conditions were severe and purposely so to secure wear that would be measurable. In a car having 32-in. wheels, the test might be likened to running in intermediate at a speed of 19 miles an hour for 114 miles.

The method of ascertaining tooth wear was to plot the outlines or contour of a tooth before and after

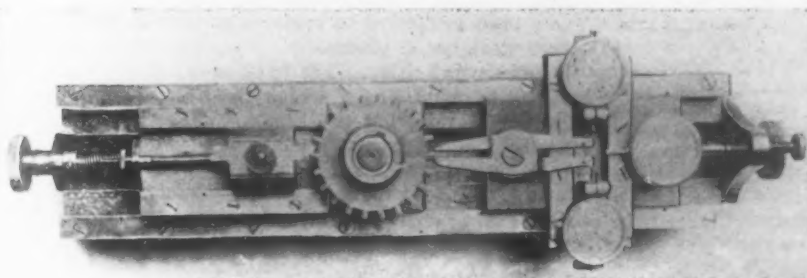
the test. For this purpose a tooth profile indicator shown in the accompanying illustration was developed. Drawing the profiles at a scale of 25 diameters showed the amount of wear and its location. One conclusion drawn from the tests was that steel for gears to be oil treated should possess at least 0.45 per cent carbon, should show 0.75 or over scleroscope hardness without brittleness, should be as clean as it is commercially practical to make it and that the specification limits of the analysis should be of close enough range to insure uniform results from a standard heat treatment. It is interesting to add that the average maximum efficiencies of the power transmission were 98.7 per cent with a maximum of 98.9 per cent, or a power loss of 1.1 per cent or 0.55 hp. for the 50 hp. load.

An Interchangeable Gear System

Under the title "Tooth Forms," E. W. Miller, chief engineer Fellows Gear Shaper Co., Springfield, Vt., contributed a paper devoted to a basis for constructing a system of interchangeable gears from the rack to a 12-tooth pinion. So well received was it that a blanket resolution was passed that papers of this caliber should be separately available to the membership in printed form and accordingly it was voted that the papers of the meeting should be published, and made generally obtainable at some nominal price. Mr. Miller, by means of remarkably clear diagrams, traced the development of the involute curve and arrived at a system involving a pressure angle of 24 deg. 4 min.

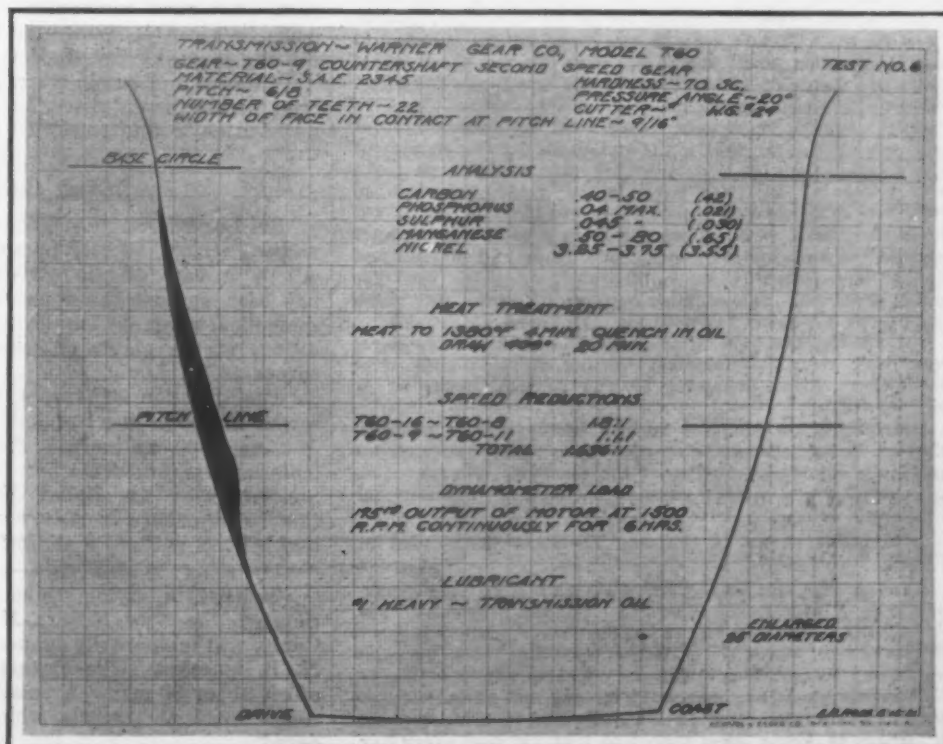
Gleason Achievements

The Rochester meeting was undeniably closely linked with the name Gleason. Whenever the association was not in regular session, it was the guest of James E. and Andrew C. Gleason. Besides providing for an enjoyable close of the three days' meeting by entertaining members and guests at a clambake reached by a 17-mile motor car trip out of Rochester on Saturday afternoon, Oct. 15, they provided luncheon for all at the Gleason works on Friday, followed first by a musicale and then by an introduction to a number of new machines in actual operation, some of them of more than ordinary economic importance. Andrew C. Gleason made the address of welcome at the opening of the convention on



Instrument Developed by Warner Gear Co. to Ascertain a Gear Tooth Profile. Two fingers carrying knife edge points lie on opposite sides of the tooth. Two of the dial indicators give the readings of the positions of the knife points in respect to the tooth center line, while the third measures the corresponding positions or distance from the point of the tooth

Plotting the Tooth Contour on a 7½ x 10-In. Cross-section Paper Gives an Enlargement of the Tooth by 25 Diameters



Thursday afternoon, and James E. was toastmaster at the banquet held Friday night. The Gleason arrangements included also special provisions for visiting ladies. Just before the close of the convention a resolution of sympathy for the founder of the Gleason works, William Gleason, was voted, expressing hope for a speedy recovery from his present illness, and briefly recounting his accomplishments in advancing the art of gear cutting.

A list of the new Gleason machines with some explanation of their scope of application is given in the following tabulation. Besides, a new electric hardening furnace designed by the Gleason works, under the direction of Leon Slade, was shown; this furnace, constructed for the plant by the General Electric Co., employs direct radiating electric resistance units or grids but has a positively driven roller table on which the product is passed automatically from end to end and at the speed necessary.

New Gleason Machines Shown in Operation

Four-in. spiral bevel gear generator, which uses cutters 1.1 in. to 3½ in. in diameter. Cuts miter gears up to 3-in. pitch diameter and flat gears up to 4-in. pitch diameter, 10 diametral pitch. Specially for sewing machine gears, motion picture machine gears, etc. Finish cut from the solid in one operation. Time per tooth 4.7 to 26 sec. Shown finish cutting 18 tooth 18 pitch miters from solid cast iron in 10 sec. per tooth.

Four-in. spiral bevel gear cutter grinder for sharpening cutters used on the 4-in. spiral bevel gear generator.

Eight-in. spiral bevel gear generator. Cuts miter gears up to 7¼-in. pitch diameter, flat gears up to 10¼-in. pitch diameter. 4 D. P. uses 6-in. and 9-in. cutters. Suitable for overhead cam shaft gears, motor reduction gears, small automobile drive gears and gears used on machine tools. Has quick return constant speed down roll. Time per tool 10 to 47 sec. Shown finish cutting 41 (12) tooth 6 pitch 3½ per cent nickel steel motor reduction gears; 23 sec. per tooth using 6-in. cutter.

Nine-in. bevel gear generator for miters up to 9-in. pitch diam. and flat gears up to 11-in. pitch diam., 3 D. P. 2-in. face. Double roll with gear connection and spiral bevel gear drive on the crank plate. Time per tooth 15 sec. to 2 min. Shown finish cutting 15-27 combination 5 pitch 3½ per cent nickel steel gears in 34 sec. per tooth.

Two tool 38-in. bevel gear planer. Cuts miters up to 38 pitch diameter and flat gears up to 52 pitch diameter, 10 D. P., 10-in. face. Upper and lower tool blocks are interchangeable to cut forward or backward. Claimed to save 45 to 50 per cent on cutting time compared to the single tool planer. Spiral bevel gear for crank plate drive. Shown cutting 50 tooth 2¼-in. C. P. cast steel gear.

Three spindle bevel gear rougher for rough cutting bevel gears up to 16-in. pitch diameter, 3 D. P., 2-in. face. Rate of feed independent on all 3 heads. Different jobs can be cut on the 3-in. heads at one time depending only upon the pitch. Spiral bevel gear used for drive on cutter spindle. Time per tooth 5 to 45 sec. Shown rough cutting differential gear and pinion 12-24 tooth 6-8 pitch 3½ per cent nickel steel; two heads on gears at 8 sec. per tooth, other head on pinions at 8 sec. per tooth.

Three spindle bevel gear generator. Finishes both sides of a tooth space at once. Up and down jiggling motion of cutter, controlled by a cam to produce straight cut tooth with proper taper. Has capacity for miter gears up to 5½ pitch diameter and gear of 2-1 combination up to 6½ pitch diameter, 5 D. P. Time per tooth 5 to 45 sec. Special purpose machine for differential side gears and pinions and similar large quantity work. Spiral bevel gears used for motor reduction. Shown finish cutting differential side gears of 24 teeth, 6-8 pitch, 3½ per cent nickel steel.

Chamfering machine for trimming the tooth ends on spiral bevel ring gears. Eliminates chipping of tooth ends after hardening. Shown trimming 60 and 65 tooth gears at ¼ sec. per tooth.

Burnishing machine for burnishing the profiles of bevel pinions. A soft pinion is run with a hard gear and crowded in by the automatic motion of the machine. No abrasives are used. Tooth contour remains unchanged. Specially for automobile rear axle drive pinions.

Equipment shown in Gleason hardening department as follows:

Carbonizing furnaces, 4 ft. wide and 6 ft. long inside. One heat of 4000 lb. total weight each day requires 60 gal. of fuel oil. Operating one 10-hr. heat after another requires 35 gal. of fuel oil per heat. Before insulating, these furnaces were using 100 gal. and 70 gal. for the same weight of charge.

Electric reheating furnace, 11 ft. long and 17 in. width of working floor. Requires 72 kw. per hour to bring to heat. If furnace is cold it takes from 5 to 6 hr.; if used every day,

from 1½ to 2 hr. This furnace heats 350 to 400 lb. of steel per hour to 1500 deg. Fahr.

Electric drawing furnace, 2 ft. wide and 3 ft. long inside. Requires 27 kw. per hour to bring to temperature. If furnace is cold it takes ½ hr. to bring to 450 deg. Fahr. Will draw 300 lb. of high speed steel per hour to 1050 deg. Fahr.

Cost of Living Stationary

Figures from the Bureau of Labor Statistics show no change in the general average of the wholesale prices of "all commodities" in September, as compared with August, both standing at 52 per cent above 1913. Farm products, cloths and clothing, chemicals and drugs, advanced during the month. Food products, fuel and lighting, building materials, housefurnishing goods and miscellaneous items dropped slightly.

Metals and metal products, at 20 per cent above 1913, are now nearer to pre-war prices than any other item listed. Iron and steel products, of course, dominate this group.

Commodity Prices (1913 = 100)

	Peak 1920	Aug. 1921	Sept. 1921	Extent of Liquidation*
Farm products	246	118	122	84.9 per cent
Food, etc.	287	152	146	75.4 per cent
Cloths and clothing.....	356	179	187	66.0 per cent
Fuel and lighting.....	284	182	178	57.6 per cent
Metals and metal products	195	120	120	78.9 per cent
Building materials	341	198	193	61.4 per cent
Chemicals and drugs.....	222	161	162	49.2 per cent
Housefurnishing goods....	371	230	223	54.6 per cent
Miscellaneous	247	147	146	63.7 per cent
All commodities	272	152	152	69.8 per cent

*Percentage by which the 1920 peak advance over 1913 has been wiped out.

To Relieve Unemployment

YOUNGSTOWN, OHIO, Oct. 18.—Progressive measures have been adopted to relieve unemployment and alleviate distress during the winter. October 20 has been designated as Registration Day for unemployed, who have been requested to register at the fire stations and other designated places.

Influential citizens are back of a campaign to raise a fund of \$200,000, of which the first \$100,000 will be devoted to relieving the needy. The rest will be used to afford employment to men out of work.

A number of large contracting interests are preparing to use two shifts of common labor, working them every other week, thus providing employment for twice as many men.

The Youngstown Emergency Relief Association has been formed to especially deal with the current situation. All steel companies are virtually on an 8-hr. basis in most departments, in order to provide work for the largest number of men.

Welfare and employment departments of all industrial establishments are co-operating with municipal authorities to find work for all men with families.

Strike Called Off

ST. LOUIS, Oct. 17.—The strike of 550 union boiler-makers, which had been on since May 1, has been called off by a vote of the striking workers. The strike has been against the open shop, and the men will be compelled to accept employment under open shop conditions at the plants of seven of the boiler manufacturers of St. Louis.

The question of wages was not involved in the strike, although in a previous controversy, which began in June, 1920, an increase from 75c. an hr. to 90c. for boiler-makers, and from 55c. to 70c. for helpers. It was announced by the Boiler Manufacturers' Association that boiler-makers from now on will receive 77c. an hr. and helpers will get a sliding scale of from 40c. to 60c.

Owing to a buying strike among the farmers of the country, the New Britain Machine Co., New Britain, Conn., will temporarily suspend the manufacture of the N. B. tractors. The closing down of the plant will affect about 50 men. A small force will be retained to assemble those tractors which have already been ordered.

Practical Plans to Relieve Unemployment

Individual Opinions Subordinated and Conference Agrees Upon Important Recommendations Which Are Being Carried Out by Various Agencies

— BY L. W. MOFFETT —

WASHINGTON, Oct. 18.—With the President's unemployment conference arriving at a unanimous agreement regarding principles looking to the relief of economic and labor conditions throughout the country and plans made to follow the proposals adopted to a successful conclusion both as to emergency and permanent measures, Administration officials consider that a memorable achievement has been accomplished. President Harding has said the conference has already "borne rich rewards." It is maintained that the greatest object in view, that of determining upon a definite program without a dissenting vote, has set a standard which will be used as a guide to develop the stimulation of business. "The detailed methods to be adopted will have to be worked out because, as was to be expected, there was a wide diversity of views on this point. Evidences of this arose in a number of committees and were reflected in majority and minority reports and were particularly marked as they relate to the Committee on Manufactures, of which President James A. Campbell of the Youngstown Sheet & Tube Co. was chairman, having been named head of the committee upon the resignation of W. H. Stackhouse, made necessary because of the desire of the latter to attend the convention of the National Implement and Vehicle Association, of which he is president. By a ruling of the conference, however, it accepted formally as its recommendations only those on which there was unanimous agreement, and the differing reports were received "as information, but not the recommendations of the conference" with the idea of making them public for study by the country upon their merits and signed by those participating in them.

The Recommendations

General recommendations adopted unanimously by the conference call for readjustment of railroad rates, speedy completion of the tax bill, definite settlement of tariff legislation, settlement of the financial relationships between the Government and the railroads, limitation of world armament, steps looking to the minimizing of fluctuations in exchange, definite programs of action that will lead to elimination of waste and more regular employment in seasonal and intermittent industries, and proportionate adjustment of the inequalities in deflation, one of the principal purposes being to bring about a recovery in agriculture.

Primarily, the outstanding work of the conference throughout was the leaving of details of solution to local communities, with the leadership placed upon the mayors of the cities and towns, and co-ordination and continuation of this work is in charge of a committee of which Col. Arthur Woods is head, while a standing committee will have a similar object in mind as to the permanent measures adopted. The conference adjourned *sine die* last Thursday, and it is not known that it will again be called into session, but it was considered that this might be necessary and for that reason it has been held subject to further meetings.

The Majority Report

By reason of its importance, especial interest was shown in the majority and minority reports of the

Committee on Manufactures. The majority report recommended the prompt passage of the measure funding obligations of the railroads for advances made by the Government; expeditious payment of Government obligations owing the railroads; transfer of the functions of the Railroad Labor Board to the Interstate Commerce Commission; repeal of the Adamson act and the elimination of "every discoverable waste and inefficiency from production, transportation, and distribution which is practically removable. This recommendation adds that "every element in our citizenship should frankly set its face against any group, whether in agriculture, business, labor or transportation that selfishly undertakes to resist necessary economic adjustment in any narrow endeavor to protect its personal interests at the expense of the permanent betterment of our national life." This report was signed by Mr. Campbell, William M. Butler, president of the Butler Mills of New England; President John E. Edgerton of the National Association of Manufacturers; A. L. Himphrey, president of the Westinghouse Air Brake Co., Pittsburgh; Mr. Stackhouse, J. A. Penton, secretary of the American Pig Iron Association and T. P. Hinman, president of the Hand Trading Co., Pelham, Ga. Chairman Charles M. Schwab of the Bethlehem Steel Corporation, a member of the committee, was not present at the conference sessions last week and did not sign the report.

The Minority Report

Strong opposition to some of these recommendations was made in a long minority report signed by President Samuel Gompers of the American Federation of Labor; Mrs. Sarah Convo, New York, secretary of the United Textile Workers of America and Roy Dickinson, a magazine editor of Orange, N. J., who constituted the so-called labor group. Apparently they construed the majority report as meaning a reduction in wages, against which they protested, and they also went on record against transfer of authority now resting in the Railroad Labor Board and repeal of the Adamson act. Labor also is at odds with the purposes to which money that would be paid to the railroads under the so-called funding bill would be put, desiring that it be used in paying labor and that there be no outside contract work by the railroads. Passage of the \$500,000,000 so-called funding bill was urged by the Committee on Transportation and the suggestion made that the railroads which are in a condition to do so should increase their maintenance, construction and other kinds of work to the fullest possible extent. William S. Carter, president of the Brotherhood of Locomotive Firemen, a member of this committee, concurred in the report with the exception that he inserted a paragraph recommending that the conference endorse the funding bill with the provision that the money advanced to the railroads be used solely in assuring the employment of railroad labor.

Statement for Employers

Ernest Trigg, vice-president and general manager of John Lucas & Co., Philadelphia, read a statement on behalf of employer members of the conference, urging all interests in the nation to join in a normal

adjustment of wages and prices and Mr. Gompers pledged the support of labor to constructive policies approved by the conference and expressed pleasure at the harmony in the conference itself. It was upon his motion that a vote of thanks was tendered to Secretary of Commerce Hoover as chairman of conference for the fair way in which he conducted the proceedings and for bringing about constructive work.

Other Recommendations

Other recommendations made called for American participation in the decisions of the reparations committee, \$400,000 for expansion of the activities of the United States Employment Service, a loan through Congressional appropriation for the prosecution of work now under way, settlement of construction problems by the communities themselves and adoption of a policy to upbuild and maintain an American merchant marine. The committee on construction industries made an exhaustive report and numerous recommendations which are reflected in the general recommendations unanimously agreed upon. Among other things it urged community action for improvement in the building industry and results already have been obtained along this line as shown by reports from various cities of the country. The report also held that long term bank deposits and savings accounts should be used primarily for long-term purposes for local action by mayors and governors and that the outstanding factors in the building and construction industry at present are financing, material costs and the labor costs. It reported that while there had been substantial reductions in costs of many construction materials, lower prices for some still are necessary. A table it prepared showed that iron and steel products, together with non-ferrous metals have been greatly reduced, some of them below cost of production. Secretary Hoover considers that construction is the key to the whole situation, claiming that every 200 men employed in actual construction sets to work from 500 to 700 in other basic industries.

Mining Conditions

The committee on mining made a report as to conditions in the production of iron ore, coal, copper, zinc ore, and lead ore and recommendations made. One suggestion favors discontinuance of the practice of preferential assignment of freight cars in the coal industry, but in a previous discussion on this subject a paragraph in the report of the committee on construction industries criticising the Interstate Commerce Commission for its policy in issuing priority orders for the use of open-top equipment for coal shipments was eliminated. The mining committee urged payment to the railroads of all funds owing them, accumulation by the railroads of at least five months' supply of coal and encouragement of building to stimulate building, especially the metal mining industry. The committee on Emergency Measures for Reclamation recommended a loan of \$90,000,000 to the reclamation funds for the prosecution of reclamation and irrigation projects in Western States, estimating this would provide employment for 44,000 men. The Committee on Agriculture suggested that all prices and all wages should be adjusted so that a normal reasonable ratio may be maintained between the income of farmers, laborers, manufactures and merchants in order that the purchasing power of the farmer may be restored. The committee also urged a reduction in freight rates.

Steel Corporation's Action

Concrete results from the conference in the way of increasing business and industrial activities and thus relieving the grave labor situation are being reported from time to time and have been the source of consid-

erable gratification. One of the leaders in the movement to provide relief is the United States Steel Corporation, which has announced its purpose to spend \$10,000,000 in the extension of its manufacturing plants and improvements. The Finance Committee of the United States Steel Corporation adopted the following resolution:

Resolved, That our subsidiary companies be requested to proceed as promptly as circumstances will permit to expend up to \$10,000,000 in the extension of their manufacturing plants, the same to be done under the immediate direction of the chairman and president of the Corporation, with the understanding that, so far as practicable, the extensions be made where the services of their own employees, now idle in consequence of diminished operations, can be utilized, and where costs will be fair and reasonable.

Railroads Add Men

The railroads have added about 25,000 men to their rolls and public utilities in many sections are increasing employment. Aid in dealing locally with the unemployment problem is promised by commercial organizations in 35 States as a result of the request of Joseph H. Defrees, president of the Chamber of Commerce of the United States, that members of the chamber cooperate with mayors in carrying out the emergency program of the unemployment conference. Up to last Friday, responses had been received from 119 chambers, commercial clubs and boards of trade to the effect that the situation was well in hand or that immediate steps would be taken looking toward relief of workers. A considerable number of organizations in centers indicating more or less unemployment said that manufacturers, where demand for their goods is slight, are keeping their entire forces at work by limiting the number of hours of plant operation. From a number of cities came word that building operations and municipal improvements projected or under way will mean that there will be no suffering. A decided improvement, it is stated, in the industrial situation generally, as compared with the summer period, is shown in most of the reports. The Associated General Contractors of America also has begun a campaign to stimulate construction.

It is the emergency situation that is naturally causing the most concern and it is felt that, with the 10 or 20 per cent of the workers who now are idle given employment so as to pass through the winter without suffering, conditions will be restored where permanent employment will be assured. The accurate number of idle workers never has been ascertained and no machinery exists for gaging it properly. This is one of the problems that it is hoped to solve by setting up an organization in the Government which will be able to gather complete and comprehensive reports on which the actual condition of employment can be thoroughly established.

Unemployment and Cycles

In this connection, there is an interesting report on unemployment and business cycles, recommending the necessity of exhaustive investigation into causes and remedies of periodic business depressions.

The report points out that it is fundamental that an accurate statistical service be organized for determining the volume of production of stocks and consumption of commodities, and the volume of construction in progress through the nation, and an accurate return of the actual and not theoretical unemployment. These services, it is stated, are now partially carried on in the different Government departments.

"Such statistical service," it is added, "would in itself contribute to minimizing the peaks and valleys in the economic curve. The same warnings that would enable intelligent action on the part of public authorities and those who control large enterprises in guidance as to the periods in which construction should be de-

ferred or should be initiated would also serve as a warning to the commercial public and would tend in themselves to effect the ends desired. As a first step in such a program, statistical services adequate to this purpose should be immediately authorized and carried out by the Federal Government.

Follow Up Work

"The committee charged with following up the work of the Unemployment Conference will have to consider other plans that have been put before the conference with the endorsement of various bodies, such, for example, as the Huber unemployment prevention bill now pending in the Wisconsin Legislature, the schemes for insuring a minimum return in lean years to both capital and labor with which certain corporations are experimenting, and the out-of-work benefits of trade unions. Various reforms of the banking and monetary systems also have warm advocates—centralized banking, stabilizing the dollar, raising discount rates earlier or more rapidly in periods of prosperity, and the like.

"All these topics and perhaps others unknown to the conference might be taken up by the proposed Committee on the Prevention of Unemployment or left alone, according as the committee saw or did not see a prospect of rendering service by an investigation. Certainly the committee should not be burdened with the duty of investigating every proposal that has been or may be made for the accomplishment of its object. On the contrary, the committee should have power to limit its investigations strictly to those plans whose merits and defects it is able to determine with the means in hand.

"A report from such a committee, prepared after due deliberation is necessary to follow out and render effective the emergency work of the President's unemployment conference. For no constructive program of preventing the recurrence of periods of widespread unemployment is likely to succeed unless it is based upon thorough investigation of the underlying facts and a matured judgment on the merits and defects of the proposals submitted to the conference."

ANNUAL STATISTICS

Steel Corporation Shows Decrease as Compared with that of the Independents

The annual statistical report of the American Iron and Steel Institute for 1920 has just come from the press. As usual, the work of compilation of the data contained in the report has been in charge of William G. Gray. Most of the statistics have been published in four bulletins in THE IRON AGE. One compilation of special interest is reproduced on this page, it being a table showing production of all kinds of finished rolled iron and steel from 1905 to 1920, inclusive. In past years, a number of products, such as hoops and bands, cotton ties, splice bars, tie plate bars, rolled sheet piling, railroad ties, rolled forging blooms, forging billets, etc., have been included under the heading, "all other finished rolled products," but in the accompan-

ing table it will be noted that these products are listed separately for the first time, so that the total under all other finished rolled products is only 2,089,912 tons.

The production of leading iron and steel products by the United States Steel Corporation shows a decrease in the percentage of total production of the country. In 1920 the Steel Corporation produced 39.4 per cent of the pig iron, compared with 44 per cent in 1919, this percentage being smaller in 1920 than in any year of its existence. In 1920 the Steel Corporation produced 45.8 per cent of the steel ingots and steel castings, compared with 49.6 per cent in 1919. Only twice before since it was organized has the Steel Corporation produced a smaller percentage of these products than in 1920. Last year the Steel Corporation produced 41.6 per cent of all kinds of finished rolled products, which was also the smallest relative percentage of production in its history, the next lowest being 41.7 per cent in 1918.

PRODUCTION OF ALL KINDS OF FINISHED ROLLED IRON AND STEEL, GROSS TONS, 1905-1920.

Year.	Iron and steel rails.	Plates and sheets.	Nail and spike plate.	Wire rods.	Structural shapes.	Merchant bars.*	Skelp, flue, and pipe iron or steel.	Hoops.	Bands and cotton-ties.	Long angle splice bars, tie-plate bars, etc.†	Rolled sheet piling, not including fabricated.‡	Railroad ties.‡	Rolled forging blooms, forging billets, etc.	Blooms, slabs, billets, and sheet bars for export.‡	All other finished rolled products.	Total. Gross tons.
1905.	1,375,929	3,532,230	64,542	1,808,688	1,060,519	3,593,601	1,435,995	445,527	.....	.....	.....	.....	41,754	.....	881,230	16,840,015
1906.	3,977,887	4,182,156	54,211	1,871,614	2,118,772	3,992,200	1,528,585	172,332	408,018	.....	.....	.....	206,110	.....	1,076,583	19,588,468
1907.	3,633,654	4,248,832	52,027	2,017,583	1,940,352	3,970,988	1,802,627	200,168	474,179	.....	.....	.....	227,782	.....	1,296,630	19,864,822
1908.	1,921,015	2,649,693	45,747	1,816,949	1,083,181	1,986,638	1,150,583	170,860	238,441	.....	.....	.....	121,321	.....	643,768	11,828,193
1909.	3,023,845	4,234,346	63,746	2,335,685	2,275,562	3,422,883	2,033,381	250,179	395,333	.....	.....	.....	341,773	.....	1,267,957	19,644,690
1910.	1,636,031	4,955,484	45,294	2,241,830	2,260,590	4,026,840	1,828,194	262,214	424,979	.....	26,508	49,048	450,933	.....	1,397,944	21,621,279
1911.	2,822,790	4,488,049	48,522	2,450,453	1,912,367	3,306,103	1,980,673	225,074	342,810	.....	22,827	39,197	231,115	.....	1,169,191	19,039,171
1912.	1,327,915	5,875,080	45,331	2,653,553	2,846,487	3,971,446	2,446,816	270,007	587,398	571,772	22,276	41,396	462,476	347,783	1,187,108	24,656,841
1913.	1,502,780	5,751,037	37,503	2,464,807	3,004,972	4,277,279	2,501,964	280,886	499,660	686,390	46,289	44,244	537,210	88,778	1,067,444	24,791,243
1914.	1,945,095	4,719,246	38,573	2,431,714	2,031,124	2,912,102	1,982,431	211,028	345,919	423,052	35,314	33,249	331,524	91,907	937,918	18,370,196
1915.	2,204,203	6,077,694	31,929	3,095,907	2,437,003	4,454,650	2,299,464	281,759	437,987	838,615	24,026	42,369	650,545	862,418	1,237,485	24,392,924
1916.	2,854,518	7,453,980	30,088	3,518,746	3,029,964	6,691,702	2,927,674	368,164	562,553	691,820	19,196	34,311	2,015,960	512,453	1,669,225	32,380,360
1917.	2,944,161	8,267,616	22,864	3,137,138	3,110,000	6,681,141	2,674,231	347,186	490,593	606,824	18,606	9,103	1,801,708	1,158,427	1,797,802	33,067,700
1918.	2,540,892	8,790,135	18,310	2,562,390	2,849,969	6,587,369	2,564,011	262,281	250,767	416,905	11,689	6,438	1,659,118	832,746	1,793,734	31,155,754
1919.	2,203,843	7,372,814	12,832	2,535,476	2,614,036	4,810,645	2,555,778	233,336	352,172	434,008	17,811	16,645	359,582	92,143	1,487,423	25,101,544
1920.	2,604,116	9,337,680	20,577	3,136,907	3,306,748	6,702,685	3,220,289	233,440	388,862	575,830	20,716	26,310	447,334	136,457	2,089,912	32,347,863

* Including concrete reinforcing bars.

† Not ascertained prior to 1912.

‡ Not ascertained prior to 1910.

METRIC SYSTEM FAVORED

Ladd Bill Has Little Prospect of Passage— Hearings Are Started

WASHINGTON, Oct. 18.—The openly expressed doubt that the people of the United States would willingly accept the metric system was stated by Senator McNary, of Oregon, chairman of the subcommittee of the Senate Committee on Manufactures, during hearings on the Ladd bill last week, and has emphasized the belief that this measure will fail of passage in Congress, if it is actually taken up. Present indications are that it will not be favorably reported and that even if such action should be taken, it will not be for a long time. Senator Ladd, author of the bill, which is identical to that introduced in the House by Representative Britten of Illinois, has said that it is proposed to hear proponents and opponents of the measure and then make a report which could be sent to the country in order to ascertain its attitude on the suggested legislation.

Senator McNary, in making his doubts known, declared that he had an open mind on the measure, but implied that he thought there might be strong opposition to compulsory legislation to establish the metric system in the United States, and that, if it is to be adopted at all, it should be by a gradual growth developed through the public schools, so that the next generation would be schooled in and prepared for it. The measure would compel adoption of the system after 10 years, but Senator McNary was inclined to the view that the people would not begin to prepare for it until that period had almost expired and consequently would not understand it sufficiently at the time it actually would become operative. Proponents of the measures have maintained that in such an eventuality as suggested by Senator McNary the fault would lie with the people, but Senator McNary did not consider that this would overcome the situation. It is their belief that compulsory legislation is necessary and that the system could not be expected to be adopted by voluntary action.

Provisions of the Bill

The measure as drawn would apply only to the sale of any goods, wares or merchandise, except for export, and to charges or collections for their transportation. It would exempt contracts made before it became effective, and the construction or use in the arts, manufacture, or industry of any specification or drawing, tool, machine, or other appliance or implement designed, constructed or graduated in any desired system.

Opponents, however, claim that if the system were put into effect partially, it would sooner or later have to be made applicable to all industries and sciences, because a widespread dual system could not endure. Moreover, they say that, even if the measure were restricted so as to apply only to the Government, this would compel the industrial interests and others doing business with the Government to do so on a metric system basis, and that this would be an entering wedge to universal application of that system, enforced either by new business methods or by amendatory legislation.

Hearings were begun on Tuesday of last week, and have consisted of short morning sessions. So far only the proponents of the measure have given testimony, but statements in opposition to the proposed legislation are to be prepared, among them being those of Secretary C. C. Stutz, secretary of the American Institute of Weights and Measures, New York, and Samuel S. Dale, editor of *Textiles*, Boston.

The substance of claims in favor of adoption of the metric system has been based on its so-called simplicity, accuracy, and the desire to establish a uniform system of weights and measures. This has been coupled with the statement that change from one method to another can be made without any great cost.

The formula of the metric system was explained in detail by Elwood Haynes, president of the Haynes Automobile Co., Kokomo, Ind., to denote what he termed its simplicity when compared with the English system, which was declared to be cumbersome and lacking in

definiteness in terms used, as, for instance, he said there are different sizes of barrels and varying weights in tons, pounds, etc. He was not speaking for adoption of the metric system particularly as an automobile manufacturer, but urged a change to this plan for general use and as the most efficient method.

Senator McNary asked him what effect the change would have on his foreign trade as an automobile manufacturer. Mr. Haynes replied automobiles are made in assembled units and that the metric system is not called for, except as to repairs.

Objections Referred To

Referring to the objection that has been made by machine tool manufacturers and other industrial interests that a change in measurements would require much trouble and expense, Mr. Haynes said that there is no reason why lathes could not readily be changed, and asserted the same is true of a large number of machines. He said it was not true as to such tools as jigs and templets, but that they have to be thrown away anyhow after a certain time in order to keep them standardized.

Arthur B. Smith, chief research engineer of the Automatic Electric Co., Chicago, said his company is preparing to operate on the metric system exclusively, and that he uses it in his laboratory work. He declared the advantages for measurements and calculations are so great that the company can afford to make the necessary transformations when outside measurements are involved. It was stated that there will be no changes in the plant in the usual measurements now being used. But, Mr. Smith said, when stocks run low the purchasing department will be requested to buy what is necessary, and if the United States is still on the English system the orders will be filled by it if proper specifications are given, but stock will be carried by one system. The first step in the change, it was declared, will be to add metric dimensions to the drawings as they come up for correction. Secondly, he said, all new drawings will be in the metric system, with the English system added so that it can be easily erased. Machines will then be changed when physical changes are necessary.

The committee was told by Theodore H. Miller, works manager of the De Laval Separator Co., that in his plants where there are 1700 people employed during the busiest periods, the metric system is used exclusively, and asserted that advantages gained have been worth more than 10 times the slight initial cost required to make the change.

Col. William Jay Schieffelin maintained that two years are being wasted in the school life of every child by the use of the present "cumbersome" system of weights and measures.

Henry D. Hubbard, secretary of the Bureau of Standards, gave a personal explanation of the operations of the metric system, and expressed strong approval of the proposed legislation. Howard Richards, secretary of the American Metric System, in speaking for the bill, said that adoption of the metric system by this country is needed in order to develop foreign trade adequately.

The hearings are to be resumed next Monday, when Dr. Harvey W. Wiley will appear at the request of the subcommittee, it is stated, and present an amendment so as to make introduction of the metric system more gradual than is now proposed by the bill. It is stated that this has been determined upon at the suggestion of sponsors of the measure who think extension of time for adoption of the system would lessen opposition to it, but opponents have said this will not be the result and that the measure has no chance of being passed.

The number of freight cars idle because of business conditions totaled 375,370 on Oct. 1 compared with 414,698 on Sept. 23, or a reduction of 39,328 according to reports just received by the Car Service Division from the railroads of the United States. Of the total, 172,420 were freight cars in good condition which could be placed in immediate service if traffic conditions demanded, while 202,950 were in need of repairs.

Implement Association Urges Rate Cut

No General Business Revival Without Prosperity Among Farmers Now Crippled by Low Prices and High Freight Charges

"THERE never has been general prosperity in this country without the farmer sharing in it, and there never will be," said William Black, president B. F. Avery & Sons, Louisville, Ky., in an address on the "Business Outlook for 1922" delivered before the annual convention of the National Implement and Vehicle Association at Chicago, Oct. 13. This meeting and this address in particular were of especial interest to the iron and steel trade in the West because normally the implement industry is one of the largest consumers of the products of the blast furnace and the mill. The fortunes of implement manufacturers and iron and steel makers are closely allied, and any signs of improvement in the situation of the former mean better business for the latter. During the past year, purchases by the implement industry have been practically nil and until buying can be resumed, iron and steel makers will be deprived of an important outlet for their products.

What the Farmer Buys

Continuing, Mr. Black stated that the farmer buys not only farm machinery but approximately one-third of all goods manufactured. The farmer was the first to suffer the effects of readjustment and his purchasing power is now about 75 per cent of normal. To better illustrate what has happened, Mr. Black cited remote sections where barter is still practiced. The farmer goes to the country store with his corn, eggs and chickens and finds that he can get much less in exchange than was formerly the case. He has nothing to sell but the products of his farm, and his ability to consume manufactured goods is limited by the exchange value of the things he takes to market. "The relative values which were built up through many decades prior to the war were generally fair," declared Mr. Black, "and until we can get back somewhere near that basis either by prices of farm products coming up, or by the prices of manufactured articles going down, our best customer will not be able to consume the old-time quantities. Progress is being made in the right direction, but it is slow, and we are not justified in expecting any great increase in the farmer's purchasing power until another crop is harvested.

A Striking Illustration

"The one great retarding factor in the readjustment of business," asserted Mr. Black, "is the high freight rates which burden all classes of society and particularly the farmer, who suffers most, because his products make heavy tonnage. A recent example is cited in the case of a complaining farmer from central Nebraska, who furnished this comparison. In 1921 the price of corn in Chicago was 55c. per bushel and the freight to get that bushel to Chicago is 26c., leaving for the farmer at his station a net return of 29c. In 1914 the price of corn in Chicago was 70c. per bushel, and freight was 14c., or 56c. net at the shipping point. How can it be possible for the farmer to buy in the usual quantities when his selling price of corn is 29c. compared with 56c. in 1914? The difference is 27c., of which 12c. is in freight.

"The ultimate consumer pays all the accumulated transportation on the raw materials and semi-finished materials, which are used to build the finished product, also he pays the freight on the finished product. It required six tons of iron ore, coal, coke and other materials to make a ton of steel. It requires about three tons of steel, pig iron, coal, coke, fuel, oil, lumber, etc., to build one ton of finished farm implements, and it has been previously shown by carefully worked-out tables that the increase in freight rates on certain farm implements delivered to Missouri River points is 40 per

cent of their pre-war costs. Remember that this 40 per cent represents not total freights but only the increase between pre-war and present rates.

"We talk most about freight rates. We must not overlook passenger fares, which add so greatly to the cost of selling, and which must also be paid by the ultimate consumer.

"It is not fair to lay this charge to the railroad officials and not look further into the reason of high rates. Many of us believe that if the railroad executives were allowed to operate their property without hindrance of Government boards and were free to pay their labor wages in harmony with wages now paid by industry for equal skill under similar working conditions, we would soon see reduction in freight and transportation rates. Statisticians of the Interstate Commerce Commission have prepared an exhibit which shows that while the average wage of farm labor is 15c. per hr., the average wage of railroad employees is 61½c. per hr. And there are 14,000,000 people employed in agriculture in this country."

Association Favors Rate Reduction

A resolution adopted at the convention of the implement association calls for an immediate reduction in freight rates and a number of corollary changes regarded as necessary to the solution of the transportation problem including settlements with the railroads of the amount due as rentals during Government operation; passage of the present bill pending in Congress, permitting the railroads to fund their indebtedness to the Federal Government, and the early repeal of the Adamson act.

World's Developed Iron Ore Resources

From a monograph published by the mining and metallurgical section of the East Europe Institute, Breslau, Germany, in the interest of German retention of Upper Silesia, some figures are given of the developed iron ore resources of the world. From these has been compiled the subjoined table. Poland's interests have been pooled with those of France in this tabulation, as have those of Austria with Germany, and special emphasis is placed on the large share of control over iron ore now exercised by the French. The tabulation covers the German resources without Upper Silesia and gives to Poland Upper Silesia.

European Groupings of Iron Ore Resources

	Iron Ore (Million Tons)	Percentage of the World
France	3,300.0	
Lorraine	2,330.0	
Poland	17.8	
Upper Silesia	16.6	
France-Poland	5,664.4	25.2
Germany (without Upper Silesia)	1,262.0	
German Austria	213.2	
Germany-Austria	1,475.2	6.6
Great Britain	1,300.0	5.8
Scandinavian countries	1,525.0	
Spain	711.0	
Luxemburg	270.0	
Larger European neutrals	2,506.0	11.1
Russia	830.9	3.7
Other European countries	254.5	2.1
United States	4,250.0	19.0
Newfoundland	3,630.0	16.2
Other countries	2,780.0	12.4
Approximate total...	22,400.00	

The Roxbury Steel Casting Co., 53 Gerard Street, Boston, does not expect to build a foundry and is not in the market at the present time for any equipment, as it has made purchases of the necessary machinery to start operations.

BRITAIN IN DEPRESSION

Comment by W. S. Pilling on Conditions as He Found Them

W. S. Pilling, of Pilling & Co., Philadelphia, returned last week from a stay of several weeks in Europe, the greater part of the time being spent in England. In response to a request from THE IRON AGE for an expression on the present industrial situation in Great Britain, particularly as affecting the iron and steel trades, Mr. Pilling has written the following:

"I hesitate to express my views regarding the European situation, inasmuch as I really did not have the time to study and digest the conditions. In fact, I am more perplexed now than before I sailed.

"The rapidly declining exchange has brought about an unparalleled situation in Europe. From what I could gather, the Belgian and German iron and steel works are doing by far the largest proportion of business in Europe, especially considering the capacity for output. I gathered that the German works that are producing pig iron and many grades of steel are fully sold up for many months ahead, and in view of the rapidly declining value of the mark it is a mystery how they can purchase raw materials and sell their products in marks at the prices at which the goods are sold. In fact, the whole German situation is so clouded that I do not attempt to understand it.

"Belgium, from all accounts, is also busy, and offering products in England and the foreign markets at such low prices that the British manufacturer has apparently abandoned efforts to compete. I did not meet a single man in the trade who was not despondent as to conditions, especially as to the labor situation. Workmen are resisting changes which it would seem are so obviously necessary that no man of intelligence could fail to see their necessity. The labor leaders appear to be blind to all signs of the times, and are striving to hold their supremacy and leadership by temporizing with the situation. It is a matter of general information that practically all grades of iron and steel can be shipped into England at considerably less than the British costs of production, and the result, of course, is a great reduction in output and consequent increase of unemployment in this line. Most blast furnaces which are running are operating at a loss, and some of them would be idle excepting that collateral conditions seem to make it necessary to run. With the present British laws regarding unemployment remuneration, there seems to be a willingness on the part of workmen to remain idle, even at a very moderate income, rather than to endeavor to secure work which would yield more.

"What struck me quite forcibly in all my conversations with men of means or influence, was the bitter criticism of many of the present laws which seem to discourage industry, and many hints of sinister motives on the part of Government officials are heard. Great Britain appears to be floundering and adrift, but those who know the history of the British people are sanguine that she will come out all right, without any one apparently knowing how it will be done. There are as many remedies being suggested as there are phases of the trouble, but with no precedent on which to build an intelligent opinion. The views expressed are widely different and have the appearance of guess-work.

"Business men appear to be more fearful of political and financial breakdowns, both in their own and other countries, than they are of the immediate future of business. In other words, they are more distressed about underlying conditions than about the present unfavorable situation. They feel that the latter could be tided over, as has been done in the past, but that there may be no substantial ground on which to build a permanent improvement. There appears to be a decreasing animosity between Great Britain and Germany and trade between the two countries is growing in volume.

"The shipping interests are in deplorable condition, many hundreds of thousands of tonnage being tied up

and dismantled for lack of employment. The whole country appears to be suffering from a lethargy, with a general feeling of discontent as to conditions, and a hopelessness as to a speedy favorable change.

British Steel Exports Still Low in August—Imports Heavier

British steel exports in August, this year, excluding iron ore and including scrap, were only 79,163 gross tons as compared with 183,373 tons per month for the first quarter and 279,256 tons in August, 1920. The June and July exports this year were 66,301 and 64,001 tons respectively. The average per month in 1913 was 420,757 tons. The August outgo is much less than even the 1919 monthly average and smaller than any month in the war years. Imports in August were 149,231 tons which contrast with 103,561 in July, with 88,083 tons in June, and with 186,040 tons per month in the first quarter. The 1913 imports were 195,264 tons per month and in 1920 they were 128,685 tons per month. The following table shows comparative data:

Gross Tons	Exports	Imports
Aver. per mo. first quarter 1921.....	183,373	186,040
July, 1921	64,001	103,561
August, 1921	79,163	149,231
Aver. per mo. second quarter 1921.....	109,670	96,320
Aver. per mo. 1919.....	188,519	50,801
Aver. per mo. 1920.....	274,881	128,685
Aver. per mo. 1913.....	420,757	195,264

The trend of some of the principal exports is shown by the following data in gross tons:

	Average per Month 1913	1920	August, 1920	August, 1921
Pig iron	78,771	38,505	26,070	3,336
Steel rails	41,676	11,213	8,731	4,848
Steel plates	11,162	16,571	15,602	6,174
Galvanized sheets.....	63,506	34,244	40,042	10,153
Steel bars	20,921	30,322	37,998	4,074
Tin plates	41,208	29,418	31,880	8,787
Black plates.....	5,679	3,026	3,299	388
Steel sheets.....	.....	.....	10,338	1,093

Iron ore imports in August were only 36,997 tons as compared with 541,742 tons per month in 1920. In August, 1920, they were 605,979 tons. The total for the first eight months was 1,295,927 tons, as compared with 4,653,626 tons in the first eight months in 1920.

Manganese ore imports were only 6039 tons in August against 37,717 tons per month in 1920 and 50,098 tons per month in 1913. The total to Sept. 1, this year, was 152,866 tons against 276,163 tons for the same eight months last year.

American Exports of Machine Tools

The decreased American exports of machine tools are but an incident of reconstruction, the depression following the business of the last year or two, and there are signs that we are already beyond the most severe stages of this depression, says *Commerce Reports*. The value of American exports of machine tools for 1920 and the first eight months of 1921 is shown by months in the following table:

Value of Lathes and Other Machine Tools Exported from United States in 1920 and Eight Months of 1921

Months	Lathes		Other Machine Tools	
	1920	1921	1920	1921
January	\$631,271	\$818,068	\$816,773	\$1,222,731
February	587,348	442,491	895,675	778,250
March	1,079,793	337,856	1,943,230	528,563
April	560,008	335,614	1,229,819	379,320
May	829,434	269,835	1,318,478	254,326
June	846,583	131,140	1,127,297	267,344
July	542,175	191,983	915,074	281,936
August	414,604	51,569	972,247	209,630
September	506,781	.....	1,176,175	.....
October	358,088	.....	1,170,075	.....
November	589,444	.....	1,131,461	.....
December	629,594	.....	1,264,939	.....
Total	7,575,123	.....	13,961,243	.....

In 1919 the value of lathes exported was \$10,136,877, while in the same year the exports of all other machine tools totaled \$12,490,600. The lathes exported

in 1918, however, amounted in value to only \$9,853,507, while all other machine tools exported in 1918 totaled \$11,626,360 in value.

Decrease in Metal-Working Machinery

The value of sharpening and grinding machinery exported in 1920 was \$3,945,490, as compared with exports of this machinery valued at \$5,494,060 in 1919 and \$6,161,876 in 1918. Exports of other metal-working machinery also showed a decrease in value in 1920 as compared with 1919 and 1918. In 1920 the value of this machinery was \$18,830,377, while it amounted to \$30,386,405 in 1919 and \$23,978,554 in 1918. Exports of sharpening and grinding and other metal-working machinery for the 12 months of 1920 and the first 8 months of 1921 are shown in the following table:

Value of American Exports of Sharpening and Grinding and Other Metal-Working Machinery in 1920 and Eight Months of 1921

Months	Sharpening and Grinding Machinery		Other Metal-Working Machinery	
	1920	1921	1920	1921
January	\$394,374	\$296,385	\$1,611,528	\$1,956,879
February	261,209	148,210	2,024,929	1,412,630
March	475,248	95,645	1,652,604	1,359,489
April	334,269	84,946	1,489,625	1,255,542
May	276,057	82,183	2,142,421	669,627
June	395,903	60,499	1,164,940	1,029,230
July	396,246	105,293	1,823,097	1,155,283
August	278,864	61,711	1,242,778	608,653
September	333,844	.....	1,190,343	.....
October	247,788	.....	1,556,908	.....
November	237,395	.....	1,373,323	.....
December	314,293	.....	1,557,881	.....
Total	3,945,490	.....	18,830,377	.....

Plates for the Navy

WASHINGTON, Oct. 18.—The Bureau of Supplies and Accounts, Navy Department, has issued its schedule asking for approximately 3000 tons of plates, bids on which will be opened on Nov. 1, together with bids for about 1600 tons of shapes, 2100 tons of bars, and 1200 tons of black sheets.

The Engineer Corps, War Department, last week sold approximately 10,000 gross tons of railroad track material to the Bethlehem Steel Co., and Hyman-Michaels Co., Chicago, the bid of the former which took 3470 tons being \$9.80, while the remainder was bought by the Hyman-Michaels Co. at \$9.11. The prices are f.o.b. cars, the material purchased by the Bethlehem Steel Co. being at Kearny, N. J., and that bought by the Hyman-Michaels Co., being at Norfolk, Va., Schenectady, N. Y., and Chicago. The tonnage includes turnouts, crossing switches, wrecking frogs, etc.

Agreed to Extend Emergency Tariff

WASHINGTON, Oct. 18.—Agreement has been made between Chairman Penrose of the Senate Committee on Finance and Chairman Fordney of the House Committee on Ways and Means to extend the emergency tariff law until Feb. 1 with the expectation that the permanent tariff act will be passed by that date, although there is considerable skepticism that this can be done. This doubt is based on the many influences at work against the permanent tariff program and some of it comes from within the Republican ranks. Notices that hearings on the tariff bill will be resumed Nov. 1 have been sent out to agricultural interests.

British Pig Iron and Steel Output in September

LONDON, ENGLAND, Oct. 14 (By Cable)

The production of pig iron in Great Britain in September was 158,300 gross tons and that of steel ingots and castings, 429,300 tons. These compare with an output of 93,600 tons of pig iron and 432,600 tons of steel in August. The average monthly output of pig iron in 1920 was 667,300 tons and of steel ingots and castings 754,700 tons.

STRONGLY DEFENDED

Attorney Lambert Quotes Justice Hughes on Reliability of Trade Paper Quotations

WASHINGTON, Oct. 18.—Strong defense of the accuracy and reliability of trade journal quotations is made by Attorney I. E. Lambert, of the Federal Trade Commission, in the brief he has filed with the commission in the so-called ferromanganese dumping case, in which he charges that sufficient evidence has been adduced to prove that the respondents, importers of British ferromanganese, had made sales in the United States at substantially less than the English or home prices. It is stated that the facts show conclusively that each respondent during the latter part of the year "dumped ferromanganese on the American market and that the said dumping was a flagrant violation of the act of Sept. 8, 1916," and constituted an unfair method of competition. Final arguments in the case are to be made on Friday of the present week.

Support of the reliability of trade paper quotations is made by Attorney Lambert to combat a contrary view which has been expressed by attorneys for the respondents. In proving the market value of ferromanganese in England during the year 1919, when it is alleged the dumping took place, copies of reliable and trustworthy English journals were offered in evidence, Attorney Lambert says, the competency of which was vigorously challenged by the respondents.

Attorney Lambert quotes a number of authorities to establish the competency of trade paper quotations. Among them was the opinion of Justice Hughes of the Supreme Court, now Secretary of State, who in speaking for the court in the case of Virginia vs. West Virginia, said:

It is unquestioned that in proving the fact of market value, accredited price, current lists, and market reports, including those published in trade journals or newspapers which are accepted as trustworthy, are admissible in evidence.

Prices current and report of the state of the market published in newspapers or otherwise in general circulation and relied upon by the commercial world are held admissible on an issue as to the value. (22 C. J. 929.)

He also quotes the following:

Such reports which are based upon a general survey of the whole market and are constantly received and acted upon by dealers are far more satisfactory and reliable than individual entrance or individual sales or inquiries. (Sisson v. Cleveland Ry. Co., Mich. 489.)

In supporting his charge that dumping constitutes an unfair method of competition and has been condemned by different governments, Attorney Lambert quotes laws of Canada, the Union of South Africa and Australia, the latter dealing directly with dumping as an unfair method of competition. He also quotes an extract from "Commercial Policy in War-time and After," by Hon. William Culbertson, a member of the U. S. Tariff Commission and a former member of the Federal Trade Commission:

The facts clearly show that there has been a systematic price cutting by the English manufacturers for the purpose of putting the American out of business and of obtaining a monopoly of the American market.

Attorney Lambert said that the importers made cuts at \$8 to \$10 a ton under the actual market value in England in sales made in the American market. Dealing with the purpose of the alleged dumping, Major Lambert says in brief:

Intent to injure the American ferromanganese industry is the only logical and natural inference to be drawn from the facts proved: Knowledge of the baby American industry, the vicious dumping, the underselling of the Americans and the drive for business which resulted in many large sales amounting to thousands and thousands of dollars. Surely it is not necessary for your attorney to argue the effect that all this would have upon a young, struggling industry.

New Constant Speed Milling Machines

The Oesterlein Machine Co., Cincinnati, has introduced a line of milling machines of the constant speed or "all geared" type. The line consists of No. 1, No. 2, No. 2 Heavy, No. 3, No. 3 Heavy and No. 4 sizes, each size being made in plain and universal types.

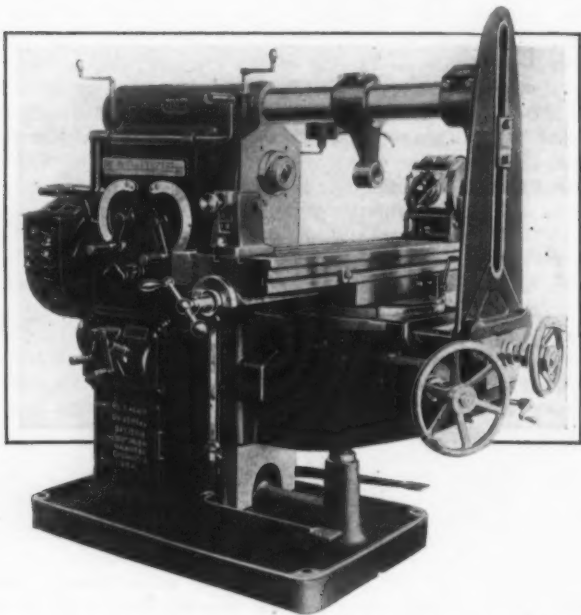
The speed mechanism consists of no more than 15 gears from which 16 geometric speeds are obtained. Only one shaft is employed in addition to the spindle and the pulley shaft. In obtaining 8 of the 16 spindle speeds, power is transmitted through a three or four gear train. It has been found unnecessary to secure any of the 16 speeds by means of quadrants or similar mechanisms.

The power consumption of the machine, as exemplifying the simplification of the speed mechanism, is given as follows: The no load power loss of a No. 2 machine varies from 0.18 to 0.30 hp. between the extreme spindle speeds of 16 to 384 r.p.m. This power

This is accomplished by adding new oil and is necessary, say, twice a year. There are no oil holes within the machine.

The driving pulleys are 14 in. in diameter and run at 400 r.p.m. Practical use is made of the high belt velocity by controlling the operation of the machine by tight and loose pulley, thus avoiding a clutch. A brake for quick stopping of the spindle is designed into the belt shifter in such a way that the belt is partially carried to the loose pulley and the brake applied to the tight pulley by a spring plunger release. The feed box is driven off of the pulley shaft, producing feeds in inches per minute.

A phosphor bronze of 28 to 32 scleroscope hardness is used for bearings and feed nuts throughout the machine. Cumberland ground steel of 0.45 to 0.50 per cent carbon is used for table, cross and vertical screws. The feed box, knee and table are similar to the design developed by the company and used in their cone type milling machines.



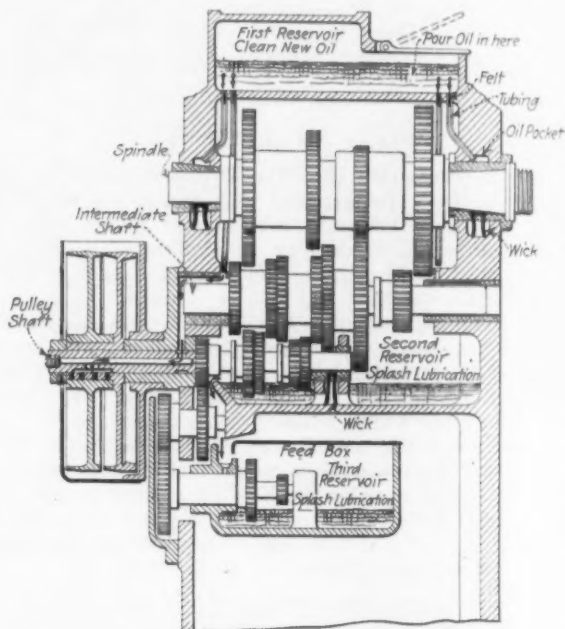
One of the New Oesterlein Milling Machines is the No. 3 Heavy Universal Type Here Shown. A feature of the line is the arrangement for automatic lubrication involving three superposed reservoirs, into the top one of which oil is poured perhaps once every two months

loss included the feed box at the highest rate of feed and feed mechanism within the knee and may therefore be regarded as practically the entire no load power loss of the entire machine. The speed changes are secured by means of two "two position" levers and a "four position" knob. The four position knob controls the selection of four adjacent spindle speeds. All speed changes may be made without stopping the machine. The gears are of low carbon forgings and hardened and finally sandblasted to remove furnace scale and the wire edge of machining operations, thus to protect the bearings from such destructive refuse.

The automatic lubrication of the machine is effected without pumps or any extra moving parts. This is accomplished by a system of three reservoirs. The first reservoir is cast in the top of the column, beside the overarm. Into this reservoir fresh oil is poured. This oil seeps through felt and down tubing to cavities cast under the main spindle bearings and to the intermediate shaft bearings and to the driving pulley. Wicks dip into the cavities under the spindle and carry oil to the spindle bearings proper. Thus it will be seen that only new oil is admitted to the bearings that are heavily loaded. The oil that passes through these bearings collects in the second reservoir, where it is distributed to the speed gears and minor bearings by splash lubrication. The overflow from the second reservoir passes to the third reservoir, which is the feed box. The feed box is oiled by splash lubrication. The capacity of the first reservoir is sufficient to supply the machine for about two months of ordinary service. Provision is made for correcting the level of oil in the third reservoir should this reservoir level decrease.

Increased Efficiency of Labor

One of the encouraging signs of the times is the increased efficiency employers are beginning to obtain from their workers in all branches of industry throughout the country, says Clarence Samuel King, secretary of the Atlantic Coast Shipbuilders' Association, in an article published in the current issue of the association bulletin. Mr. King states that the improvement in



output per man at the present time as compared with what it was during and shortly after the war has been so noticeable that some of our industrial leaders are beginning to see their way toward a solution of the output problem and, furthermore, it seems that we are approaching a period in our industrial progress when a fair day's work for a fair day's wage is within the range of possibility. Mr. King says there are many instances that could be cited in support of this gratifying change for the better and points out a few outstanding cases that have come under his personal observation which serve to indicate the present trend among workmen to give full measure for value received.

The conclusions deduced by Mr. King from these widely separated reports is that a solution of the problem of production will rest more and more upon the selection of workers who agree with progressive employers that it pays to give the best that is in them and who are willing to meet the altered conditions of the times with unrestricted output.

The October meeting of the Cincinnati chapter of the American Society for Steel Treating will be held at the Ohio Mechanics' Institute on Oct. 21. The program calls for a round table discussion of the Indianapolis convention.

CONTENTS

Steel Foundry Has Special Operating Features	991
National Steel Foundries Add Two Tilting Open-Hearth Furnaces with Removable Ports—Mold Drying Oven Opens at Both Ends	
Investigation of Defects in Extruded Metals	996
Origin and Remedy Discussed by British Institute of Metals—Testing with Scleroscope—Age-hardening of Aluminum Alloys	
Cost of Rolling Steel in Blooming Mills	998
Electric Drive Compared with Steam-Driven Units—Cost Comparisons on Basis of Tonnage Favor Electric Operation	
Gear Standardization at Rochester	1001
Substantial Progress Featured Meeting of American Gear Manufacturers' Association—Design and Material Standards Approved	
Practical Plans to Relieve Unemployment	1007
Individual Opinions Subordinated and Conference Agrees Upon Recommendations Which Are Being Carried Out	
Threat of Railroad Strike Calmly Received	1022
Iron and Steel Manufacturers Show No Excitement on Account of Threats—General Belief That Employees Could Not Succeed	
Machine Tool Builders in Convention	1026
Cost Accounting, Standardization and Statistical Service for the Industry Chief Topics at New York Meeting	
Chicago Foundry Conditions.....	1000
Plant Operations.....	1000
Blast Furnace Operations.....	1000
The 1922 Rail Demand.....	1000
Cost of Living.....	1006
Labor Notes	1006, 1014
Steel Production Statistics.....	1009
Metric System Favored.....	1010
Implement Association Urges Rate Cut..	1011
World's Developed Iron Ore Resources..	1011
Britain in Depression.....	1012
British Steel Exports and Imports	1012
American Exports of Machine Tools.....	1012
To Extend Emergency Tariff.....	1013
British Pig Iron and Steel Output.....	1013
Trade Paper Quotations.....	1013
New Milling Machines.....	1014
Editorials	1016
A Strike Against the People—Distortions of Market Facts—Liquidation in Steel Prices—Greasing Standardization Ways.	
Correspondence	1018
Industrial and Technical Photography.	
Industrial Relations Conference	1019
International Engineering Dinner.....	1019
New York Steel Treathers.....	1019
Pittsburgh Foundrymen's Association....	1019
Duralumin for Gears	1020
Safety Gage Glass Valve.....	1021
New Grinding Wheel Dresser.....	1021
Engineering Meetings.....	1028
Plan Pig Iron Contract.....	1029
New Schedule for Manufacturers.....	1029
Marked Improvement in Fabricated Steel	1045
Coke Rate Reduced.....	1045
Foreign Market Conditions..	1043, 1048, 1049
New Ore Tariffs Filed.....	1048
Pittsburgh Plus Case	1048
Cost Association Conference in Pittsburgh	1049
Iron and Steel Markets.....	1030
Comparison of Prices.....	1031
Prices Finished Iron and Steel, f.o.b. Pittsburgh.....	1044
Non-Ferrous Metal Markets.....	1045
Personal Notes	1046
Obituary Notes	1047
Machinery Markets and News of the Works.....	1050
New York Jobbers' Prices.....	1060

ESTABLISHED 1855

THE IRON AGE

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Member of the Audit Bureau of Circulations and of
Associated Business Papers, Inc.

Published every Thursday by the IRON AGE PUBLISHING CO., 239 West 39th Street, New York

F. J. Frank, *President*

George H. Griffiths, *Secretary*

Owned by the United Publishers Corporation, 239 West 39th Street, New York. H. M. Swetland, *Pres.*, Charles G. Phillips, *Vice-Pres.*, A. C. Pearson, *Treas.*, F. J. Frank, *Secy.*

BRANCH OFFICES—Chicago: Otis Building. Pittsburgh: Park Building. Boston: 410 Unity Building. Philadelphia: 1420-1422 Widener Building. Cleveland: Guardian Building.

Cincinnati: Mercantile Library Building. Washington: 816 Fifteenth Street, N. W. San Francisco: 320 Market Street. London, England: 11 Haymarket, S.W. 1.

Subscription Price: United States and Possessions, Mexico, Cuba, Shanghai, \$6.00; Canada, \$8.50; Foreign, \$12.00 per year. Single copy 50 cents.

Entered as second class matter, June 18, 1879, at the Post Office at New York, New York, under the Act of March 3, 1879

A Strike Against the People

The railroad labor unions, in deciding on a nation-wide strike beginning Oct. 30, have chosen to make war on 100,000,000 people rather than accept any share in the economic readjustment through which the country is passing. Developments of the week have been fairly startling. First the railroad executives signified their intention of asking for a 10 per cent wage reduction beyond that of 12½ per cent that went into effect on July 1, the expectation being to pass the reduction to the public in lower charges. The union officials countered by calling the strike. The third move was made by the so-called "public group" of the Railroad Labor Board, which took the astonishing course of calling upon the railroads to reduce their charges by an amount equal to the July wage reduction and the subsequent adjustments.

There has been much criticism of the Railroad Labor Board on the ground that it has not been deflating railroad wages as rapidly as circumstances required. At the recent unemployment conference at Washington there was a strong majority in favor of abolishing the Railroad Labor Board on this account. There has been criticism of the so-called "public group" of the board, on the basis that it has not been neutral but has leaned to the side of the unions.

Now the public is confronted with some very clear cut issues. The Transportation act was expected to avert strikes. It makes it the duty of railroad officials and employees "to exert every reasonable effort and adopt every available means to avoid any interruption to the operation of any carrier growing out of any dispute between the carriers and the employees." Yet even the great wage advance of July, 1920, made retroactive to May 1, was the subject of not a little strike talk, and the strike now called is based on a "strike vote" on the subject of the first reduction ordered by the board, the 12½ per cent adjustment of last July. Of what avail are the labor provisions of the Transportation act?

A second clear cut issue is whether the so-called "public group" in the Railroad Labor Board is moved by consideration of the instructions the Transportation act gives the board or is filled

with the same kind of fear that actuated official Washington at the time of the passage of the Adamson act five years ago. The instructions are that the board shall be governed by "the scales of wages paid for similar kinds of work in other industries," "the relation between wages and the cost of living" and certain other points not particularly important in this connection. There is not a word in the act suggesting that there be a connection between wage rates and freight and other charges, yet the so-called "public group" now calls upon the railroads not to reduce rates in connection with further wage reductions, which the railroad executives have undertaken to do, but to reduce them in connection with the first wage reduction.

What the act does do is to require that rates be fixed to yield a certain return upon the railroad valuation after wages and other expenses have been met. The railroads will do well, as matters now stand, if they show 3 per cent for the present year instead of the intended 6 per cent, and should they have greater earnings next year only one-half the excess could be used to make up the deficiency, the other half going to the Interstate Commerce Commission's contingent fund.

The third clear cut issue is the attitude of the union officials toward railroad earnings. In nothing were they more emphatic at the hearings preceding the wage reduction of last July than in their contention that the board could not associate wage rates with railroad charges and earnings. Now the union officials insist that charges be reduced on account of the wage reduction of last July. The Plumb plan air castle remains in their minds. They wish to keep the railroads impoverished, so that they cannot save themselves. The strike itself, the leaders hope, will cause the taking over of the roads by the Government. The head of the locomotive engineers said Monday that "that must come eventually," showing plainly the purpose to get back to the plunder-bund days of politico-union control.

The railroad unions have set themselves to block what in the thought of the entire people is the readjustment most necessary to industrial revival—reductions in freight rates through reductions in the excessively high wages of rail-

road employees. Asked to accept a fraction of the reductions from war-time wages that have been made in all industrial lines, the railroad unions have defied the Government agency created by law to decide the question and set out to have their way at whatever cost of loss and suffering to the public. The strike, if it comes, will be a calamity. Yet a greater calamity would be the success of the strike or any yielding to men who have set themselves against the people and the law.

Distortions of Market Facts

When anything unfavorable happens in the industrial world someone can generally be found to blame the steel business, and it was hardly to be expected that it would escape in the case of the threatened railroad strike. W. G. Lee, president of the Brotherhood of Railroad Trainmen, comes to the front as the accuser. In the classic language of Mr. Lee, "Executives are pulling the same old stuff," and then he adds: "They think they can hoodwink the people again. They're trying to do just as the steel manufacturers did during the war, when steel jumped from \$25 and \$28 to \$47 a ton. The steel workers took four cuts in pay on the employers' promise that steel was coming down, but it's still at the war price. This situation is parallel."

Mr. Lee, by selecting one product on which the price to-day is nominally the same as it was for the greater part of 1919 (though there has been practically no rail market for months), seeks to give the impression that all steel prices are the same as they were during the war. Even in the case of steel rails, to which evidently he refers, the price is lower by \$10 than it was in 1918, and during the war standard sections went to \$85 both at home and abroad. But if Mr. Lee had wished to make a fair comparison he would have taken a number of leading iron and steel prices and had he done so he would have found that these prices are now only about 34 per cent higher than they were in 1913, and that the increased cost of producing these products is more than 34 per cent, the increase being due almost entirely to the high wages paid to railroad employees. A glance at the figures printed last week in *THE IRON AGE* marking the trend of prices of the leading products since Jan. 1, shows how false the assertion is that resistance to reasonable reduction of freight rates and wages of railroad employees can be justified by the history of the steel market.

One of the results of the present depression is the return to graduate work of young men who have spent some time in the industrial world. It is reported that at many American universities, particularly at Columbia and Cornell, the influx this month of students into the post-graduate schools has been beyond precedent. A large proportion of the increase is said to be made up of professional men out of employment who find this a profitable and opportune time to increase their knowledge. In some institutions the percentage of increase in this class of students has never

been equaled. It is fortunate that so many are not only able financially to pursue this course but are eager to add to their professional equipment. It is a testimonial to the value of such training, and there will be large benefit to industry when these men are called back to their various fields.

Liquidation in Steel Prices

If men generally were in the habit of memorizing the pronouncements of the self-appointed economists who from time to time undertake to tell business men how to conduct their affairs these pronouncements would soon fail to attract any attention, since experience shows that they do not work out. Usually they sound well at the moment, and they are forgotten before the passage of time proves that they were not well founded.

There was, for instance, the criticism early this year of the steel makers in general and of the United States Steel Corporation in particular, that steel prices were not being "deflated" and that the refusal of the steel makers to do the right thing was preventing the revival of business activity. The criticism reached its warmest stage in March, when the actual circumstances were that the Steel Corporation was holding its prices up to the level to which it had held them down in 1920, and was doing so chiefly by the desire of its customers, while the independents were cutting those prices and were operating at lower rates than the corporation.

Meanwhile there has been more than a thorough deflation in steel prices, for they have made a nearer approach to the prices of 1913 than has been made by commodity prices in general. *THE IRON AGE* composite of finished steel prices stood at 2.20 cents on Sept. 20, this including the advanced price of 2.60 cents on wire. With wire at its former price, the composite would be 2.19 cents. The composite of the average of 1913 prices stands at 1.66 cents. Thus, using 1913 average prices as 100, or base, the recent low in finished steel stands at 132. The Department of Labor, using this system, found commodity prices at wholesale at 148 for last July and at 152 for August, showing an advancing tendency. Steel prices at 132, therefore, had been deflated more than commodity prices in general. The strain upon producers was even greater than is indicated by this comparison, on account of high freight rates, which are not deflated at all, having a greater influence upon steel production costs than upon commodity costs generally.

The contention early in the year was that steel was not doing its duty and that if steel prices were deflated a large demand would be created. What has occurred? Even at this late date the consumption of steel has not been stimulated by the price deflation. It is true demand upon the mills has been increasing in the past three months, but that is chiefly because three months ago consumers were drawing upon stocks. There is no reason to suppose that this increase in demand would not have occurred if steel prices had been left several dollars a ton higher. The steel

producers know, and outsiders could learn if they would inquire and heed what they are told, that men buy steel when they need steel and will not buy when they do not need it, no matter how low the price.

In the past few weeks there has been a stiffening tendency in steel prices. That is attributable, not to demand outrunning the supply, but to mills realizing that their experiment in deflating prices to a level below the actual cost of production did them no good, so that now they wish to secure cost at least in their sales. The experiment was particularly crucial. If the price decline had stopped at the cost level it might have been urged that a little further decline was needed.

The unfortunate thing is that men do not remember what the critics of the steel industry were saying last spring. Application of the test of time in a few such cases would put the public on its guard when critics arise to assert that business men do not know their business.

Greasing Standardization Ways

Several impressions worth mentioning are left by the meeting of gear makers in Rochester last week. One not altogether new is that a high degree of camaraderie may be established and maintained among business competitors even in a movement looking toward standardization of product and therefore toward writing off from the assets account of the materials and equipment not suited to the standardized article. It is recognized that the trend of a standardizing development and the time required to put it into full effect provide for getting the manufacturer's house in order, but compromise in some cases and the relinquishment of cherished ideas in others do not usually follow without a straining of harmonious relations.

Five years of working show how slow relatively is the achievement of standardization, but the numerous detail matters and the complexity of some of them are not realized by the user of the product. What appear to be going on at present in the gear association are various parallel investigations which are calculated to reach completion more or less simultaneously rather than one at a time, as would be the case were there less general planning and less correlation of effort. The laying down of programs for these parallel activities is one of the noteworthy lessons carried from the meeting; general committee headship steering each committee along specific paths which are only followed after acquiescence by vote of the meeting.

As was to be expected of a body concerned with technology, but at the same time commercial, agreement is sought wherever possible with other associations having to do with engineering standards. Not merely is cognizance taken of what these associations have done, but it is sought to work with them through conference committees or through direct representation. Finally the association has learned to relieve the strain of concentration on a technical controversy by occa-

sional pleasantries. Engineering bodies actually might get results more quickly if they numbered in their ranks a few diplomatic wits who know just when to give the welcome twist to the surcharged discussion.

CORRESPONDENCE

Industrial and Technical Photography

To the Editor: During the last few years photography has more and more developed to be an important factor in industry, commerce and science, and a number of large concerns have established permanent photographic departments of their own as an aid to better efficiency in administration, engineering, research, buying, selling, advertising, education, co-operation, and for many special purposes peculiar to the individual needs of the concerns.

All have been striving for the same result—to make photography a help and not merely an added overhead expense. As industrial and technical photography not only has come to stay, but will get a much larger application in the future than heretofore, it would seem wise if all organizations which use photography in one form or another could put their experiences together for the benefit of all.

It is, therefore, the purpose of this article to ask all who use photography in their plants or organizations to assist the writer in making a survey of industrial and technical photography by sending him samples of different types of photographs used; a short statement of how and why photography is being used, as in field, office, plant or research; information as to how far an outside photographer is employed; or if the users have photographic departments of their own, together with a history of the development of the same. Methods of mounting, filing and reference are important; also statements of the costs and upkeeps of the departments and the value and importance of them.

In case one has a photographic department of his own, would it be advisable to recruit his help from the photographic profession, or develop some of his men for this work? Should our technical schools train men to meet the growing demand for practical industrial photographers?

The writer will compile all such data and information, and in line with his experience of eight years in industrial photography, will make a complete history of its development and uses, to be published in one of our leading technical magazines. The more each individual contributes to an article of this kind the more valuable it becomes.

Would a convention of the users of industrial and technical photography be of any value? If so, will interested readers pledge their presence and support to a convention of this kind, and where would they suggest that it be held?

If enough interest is shown and a large enough attendance could be secured, the plan would be to arrange a conference, with an exhibition of all forms of technical and industrial photographs, and lectures on different photographic subjects in relation to industry, science, research and commerce.

JOHN H. GRAFF,

Industrial Photographer and Photomicroscopist,
Brown Co., Berlin, N. H.

The Weirton Steel Co. now is operating at practically 100 per cent, having recently put on the five tin mills which had been down at its Steubenville, Ohio, works, while it is operating all seven of its open-hearth furnaces. The company has 50 tin mills at its three plants. The average operation is reduced slightly by the fact that the company is running only 25 to 30 per cent of capacity on its strip mills.

Industrial Relations Conference at Harrisburg from Oct. 24 to 27

The Industrial Relations Conference to be held at Harrisburg, Pa., under the auspices of the Department of Labor and Industry of Pennsylvania will begin with an evening session on Monday, Oct. 24. Clifford B. Connelley, commissioner of the department, will preside, and addresses are scheduled by Governor William C. Sproul of Pennsylvania and Secretary of Labor J. J. Davis.

A session on Tuesday morning, Oct. 25, is to be devoted to "Industrial Co-operation," with addresses on the so-called four factors in industry: the employer, the employee, the public and the State. An address is also to be given by Dr. Frederick Willson, Reading, Pa., on the foreign outlook. For the afternoon the subject is "Women and Children in Industry" and for the evening "Stabilizing Industry and Employment" with speeches by two publicists.

For Wednesday morning, Oct. 26, the subject is "Industrial Waste" and among those scheduled to speak are L. W. Wallace, executive secretary Federated American Engineering Societies, Washington, on unemployment and Magnus W. Alexander, managing director National Industrial Conference Board, on hiring and firing. Industrial education is the subject for the afternoon of that day, and in the evening Secretary of Commerce Herbert Hoover is scheduled for an address on "Industrial Waste."

The subject for the Thursday morning session, Oct. 27, is "Industrial Publicity," with papers on industrial publicity from the standpoint of the daily newspaper, the industrial plant magazine, the technical journal and the trade journal. John Frey, editor of the *Iron Molders' Journal*, has been asked to present the case of the trade journal and W. W. Macon, managing editor THE IRON AGE, the case of the technical journal. For the afternoon the subject is "Medical Supervision in Industry," and for the evening "Workmen's Compensation."

International Engineering Dinner

Nearly two hundred engineers attended the dinner to the delegation from the American Engineering Societies to Great Britain and France at the Hotel Pennsylvania, Monday evening, Oct. 10. Representatives of the British and French governments and of foreign engineering societies gave to the event an international aspect unique in gatherings of engineers. Messages from men distinguished in science, statesmanship and diplomacy were read. Medals struck by the French Government were presented to the general chairman of the deputation, to the chairman of each individual delegation and to the presidents of the four so-called founder societies.

J. Vipon Davis, president United Engineering Society, acted as toastmaster. The speakers were Ambrose Swasey, Charles F. Rend, F. B. Jewett, A. S. Dwight, John R. Freeman, all members of the deputation; and M. Gaston Liebert, French Consul General; Capt. C. H. Armstrong, British Consul General; C. G. Clapperton, representing the British Institute of Electrical Engineers, and Prof. Jacques Cavalier, spokesman for the French universities. Among the engineers from other cities was Governor James Hartness of Vermont.

Captain Armstrong, the first speaker, thanked the assembled engineers on behalf of his government for the honor bestowed upon Sir Robert Hadfield, who with Eugene Schneider of Paris received the John Fritz gold medal at the hands of the deputation. Mr. Davies in a glowing eulogy presented Ambrose Swasey, past president of the American Society of Mechanical Engineers and sponsor of the Engineering Foundation, as the "dean of American engineers." M. Liebert told of the greater water power resources of France in the development of which French engineers had sought guidance in America.

Prof. Jacques Cavalier, rector at Toulouse and a widely known authority on metallurgical chemistry, comes to America as the result of arrangements for an annual exchange of professors of engineering and

applied science between French and American universities. He will divide his time during the academic year among the co-operating institutions, Columbia, Harvard, Yale, Cornell, Johns Hopkins, Massachusetts Institute of Technology and the University of Pennsylvania. The American universities have selected as their representative for the first year, Dr. A. E. Kennelly, professor of electrical engineering at Harvard.

Cable messages were read from Sir Robert Hadfield, London, Dr.; Eugene Schneider, head of the Creusot Works, Paris; the Institute of Civil Engineers, the British Institute of Mining and Metallurgy and Mining Engineers, Capt. Riall E. Shankey, president British Institute of Mechanical Engineers; Magnus Mowett, secretary British Institute of Mechanical Engineers; the Iron and Steel Institute, London; the Engineers Club of London, the Faraday Society, Viscount Bryce, Arthur Neal, member of Parliament from Sheffield, and A. E. Kennelly, Harvard, American exchange professor in France.

New York Steel Treaters

The first meeting of the New York Chapter of the American Society for Steel Treating, in the regular series of monthly sessions for the 1921-1922 season, was held Wednesday evening, Oct. 19, at the Bush Terminal Sales Building, 132 West Forty-second Street, New York. The chief speaker was Dr. John A. Mathews, president Crucible Steel Co. of America, who delivered a lecture on "Characteristics of Tool Steel, Mild Steel and Alloy Steel," illustrated with lantern slides.

For each monthly meeting the program committee of the chapter has selected a definite subject on which some well-known authority will speak. Besides the one for the October meeting, the following have been selected: November, "How Tool Steel Is Made; Comparison of Foreign and American Methods"; December, "What Happens to Steel When You Heat and Quench It?"; January, "Annealing and Tempering Machine and Tool Steels"; February, "Case Hardening, Ways of Doing It and What Happens"; March, "Treatment of High-Speed Steel"; April, "Hardening Room Troubles, Shrinkage, Warpage and Sealing"; May, "Up-to-Date Hardening Room Equipment Furnaces, etc."; June, "Spotting the Reason for Failures in Service." At each meeting there will be ten-minute talks on current events in the metallurgical world as published in the technical press.

Pittsburgh Foundrymen's Association

A. E. Blake, Pittsburgh manager of the United Gas Improvement Co., Philadelphia, who was the speaker at the regular monthly meeting of the Pittsburgh Foundrymen's Association at the General Forbes Hotel, Oct. 17, could see no good in the present day gas producers, which he declared were relatively as wasteful of coal and heat as the beehive ovens were of coal and useful by-products, while admitting that the coal reserves of the country were ample for centuries to come, it was not too soon to begin to think of the conservation, he declared, and strongly urged the use of other means of gasification than the producer. He asserted that producer gas contained so much nitrogen as to decrease very materially its efficiency and also pointed out that since it could not be sent great distances the furnaces had to be nested close to the producers. The gas must be low in sulphur, he insisted, to avoid the spoiling of heats, claiming that on an average one per cent of open hearth heats were being spoiled by the use of poor producer gas. Coal and water gas installations were advocated by the speaker.

The association adopted a resolution co-operating with other foundry associations in requesting the Interstate Commerce Commission to grant a reduction in the freight rates on pig and scrap iron and sand and gravel.

The net profits of the Pittsburgh Steel Co. for the year ended June 30 last were \$1,722,527, compared with \$1,961,459 in the previous year.

DURALUMIN FOR GEARS*

Considered As a Material for Worm and Other Gearing

Duralumin is an aluminum alloy combining the lightness of aluminum with the strength and toughness associated with ferrous metals. This metal was first made in Germany and was developed by A. Wilm and associates during the years 1903 to 1914. The principal and unusual feature of this alloy is that after it has been hot, or hot and cold worked, it may be further strengthened and toughened from 40 to 50 per cent by heat treatment. This heat treatment is somewhat analogous to that of the heat treating alloy steels and consists of quenching from temperatures below its melting point followed by an aging process. The increased physical properties are not all produced immediately on quenching but increase during the subsequent aging. In addition to being made in Germany the manufacture of duralumin was taken up in England by Vickers, Ltd., prior to the late war. During that conflict its use for structural purposes in connection with aviation brought the material before the eyes of the engineering world. To-day duralumin is recognized as occupying the same relative position to ordinary aluminum sheet or bar that heat treated alloy steel does to ordinary carbon steel.

Duralumin is an aluminum alloy containing copper, manganese and magnesium. Its strength and toughness are comparable with mild steel and are obtained with a specific gravity of 2.81 as against 7.8 for steel. The melting point is approximately 655 deg. C., the recalcence point is 520 deg. C., the annealing temperature is approximately 360 deg. C., and the co-efficient of expansion is 0.00003237 per degree of temperature centigrade. The chemical composition of the alloy varies within the following limits, copper 3 per cent to 5 per cent, magnesium 0.3 to 0.6, manganese 0.4 to 1 per cent, remainder aluminum, plus impurities. Small quantities of other metals are sometimes added for certain specific reasons, as for instance, chromium may be added to increase the burnishing qualities of the metal.

Navy specifications require in the heat treated condition: Yield point in tension, 25,000 lb. per sq. in., and tensile strength 55,000 lb. Also a quenched elongation per cent in 2 in., of 18 per cent in sheets or strips; quenched specimens not to be tested within four days after completion of heat treatment.

It might be noted in passing that in duralumin forgings where the sections are heavy it is advisable to lower the minimum tensile requirements to 50,000 lb., and a proportional increase in elongation will be found.

Duralumin is the only light metal that can replace steel in forgings, with a two-thirds saving in weight. Heat treated duralumin forgings approximate mild steel forgings in strength. Wherever weight is a deciding factor, duralumin is the most satisfactory metal for most shapes made by hot working or forging. Naturally duralumin forgings are especially desirable for reciprocating or moving parts where inertia, due to their own weight, forms a large part of the total stress.

Manufacture of Duralumin

The manufacture of duralumin is somewhat analogous to that of steel and in brief is as follows:

1. Manufacture of the alloy from its aluminum base.
2. Casting the ingot.
3. Hot rolling or cogging in blooms, billets or slab.
4. Hot or cold working to final shape.
5. Heat treating.

The ingots are poured at as low a temperature as is practicable, that is to say, just enough above the melting point to fill the mold and prevent cold shuts.

The ingots are then either hot rolled or cogged into slabs, blooms or billets, similar to the manner of work-

ing steel. This hot working is done at a temperature of 450 to 480 deg. C. and care must be used not to perform any work on the metal above these temperatures as there is a danger of hot-shortness if the material is rolled or forged at higher temperatures. It is readily seen that such low temperatures cannot be judged by color, and it is therefore necessary to use accurate pyrometers in heating the metal, previous to working.

The final rolling or forging may be done hot or cold according to the character of the work being handled or the nature of the shape it is desired to produce.

The hot or cold worked metal in its final shape shows greatly improved physical properties over the cast ingot but the full development of its qualities is only obtained by a specific heat treatment. To obtain this heat treatment the metal is heated to a temperature of 500 to 520 deg. C., for a period of time, depending upon the section of the piece, and immediately quenched. The heating and quenching immediately start to improve the physical qualities of the metal, but the maximum results are obtained only by the subsequent aging. During the aging period which takes from one to five days, the alloy markedly increases in tensile strength, hardness and elongation. Aging is sometimes accelerated by placing the metal in a hot water bath up to 100 deg. C. or in a hot room.

Physical Properties

The various stages of manufacture as related, increase the physical properties of duralumin by distinct steps and are shown as follows:

The cast ingot shows a tensile strength of from 28,000 to 32,000 lb. per square inch, with an elongation of 1 to 3 per cent.

The hot or cold worked metal shows a tensile strength of 40,000 to 50,000 lb. per square in. with an elongation of 6 to 12 per cent. These last figures are quite variable depending upon the amount of working in the cold state. Upon subsequent heat treatment and aging, the physical properties of duralumin show a marked increase, namely, 55,000 to 65,000 lb. tensile strength per sq. in. and an elongation of 18 to 25 per cent.

When it is required to put a considerable amount of work upon duralumin in its finished state it is often found necessary to anneal sheets between operations in precisely the same manner as other metals. This annealing should be done at 350 deg. C. If several drawing operations are to be performed it may be necessary to anneal the metal between such operations. Annealed duralumin can be heat treated.

Duralumin may be cold worked after heat treatment and aging. This operation produces a hard, smooth finish, and materially increases the tensile strength of the metal at the expense of elongation. That is, the tensile strength will increase 6000 to 10,000 lb. per square inch over the tensile strength of the heat treated metal, but the elongation may drop as low as 3 to 4 per cent.

In the annealed form it can be drawn, spun, stamped and formed into a great variety of shapes, similar to brass and mild steel. The physical properties in this state average:

Ult. tensile strength per sq. in., lb.....	25,000 to 35,000
Yield point per sq. in., lb.....	22,000 to 24,000
Elongation in 2 in., per cent.....	12 to 15
Brinell hardness	57
Scleroscope hardness	11

Duralumin in its heat treated form may be slightly shaped or formed and may be bent cold to 180 deg. over a mandrel four times the thickness of the sheet. Its remarkable tensile strength is here combined with its maximum elongation as follows:

Ultimate tensile strength per sq. in., lb....	55,000 to 62,000
Yield point per sq. in., lb.....	30,000 to 36,000
Elongation in 2 in., per cent.....	18 to 25
Brinell hardness	93 to 100
Scleroscope hardness	23 to 27

Heat treated duralumin forgings have similar physical properties.

Heat treated and hard rolled duralumin is used where no bending or forming is required. It is a very hard,

*From a paper by Robert W. Daniels, metals division, Baugh Machine Tool Co., Springfield, Mass., read before American Gear Manufacturers' Association, Oct. 14.

strong, springy metal in this state, and takes a polish. Its physical properties in this form average:

Ultimate tensile strength per sq. in., lb....	67,000 to 72,000
Yield point per sq. in., lb.....	58,000 to 65,000
Elongation in 2 in., per cent.....	3 to 8
Brinell hardness.....	130 to 140
Scleroscope hardness.....	39 to 42

As a Material for Worm Wheels

From the general description of duralumin it will be readily seen that it is an ideal material for worm wheels provided the bearing or wearing qualities are satisfactory. For a given section the weight is one-third that of the conventional bronze. The tensile strength and relative high elastic limit ensure superior tooth strength. The homogeneous structure and uniform hardness of heat treated duralumin forgings ensure entire freedom from hard spots, porosity and spongy areas.

Comparative tests of bearings made from duralumin against bearings made of genuine babbitt show that for shaft speeds exceeding 700 r.p.m. and loads over 200 lb. per sq. in., duralumin bearings develop less friction, remain cooler and show practically no loss in weight under most severe conditions. It is needless to say that for lower bearing pressure and slower speeds, babbitt metal is superior.

A considerable number of duralumin worm wheels are now actually in regular service in trucks ranging from 1 ton to 3½ tons capacity. These wheels have been in service from a few weeks to over two years without any failure.

For General Gearing Purposes

The same qualities that make duralumin a desirable material for automotive worm wheels also make this material valuable for plain spur and other gearing. It is suitable for this class of work where the pressures are sufficiently within its elastic limit of 30,000 lb. Where this condition is met, the weight and quietness are desirable, it replaces iron, steel, brass, fiber, fabric, etc. Where duralumin can be run with steel rather than against itself the best results are obtained. An example of this application is found in the timing gear trains of automobile motors where both long life and quietness are essential.

Helical cut spur gears of duralumin alternated with steel gears have been successful in service. Detailed test reports are not especially interesting as the gear design varies with every motor, but the fact that upward of 60,000 duralumin camshaft and idler gears are now in use, is conclusive.

That duralumin gears when meshed with steel gears are quiet may seem somewhat paradoxical since when struck, all duralumin forgings are resonant. The explanation is undoubtedly due to the difference in pitch of the sound vibrations of steel and duralumin. This, of course, is only true when the mass and section of the duralumin gear is properly proportioned to the steel gear.

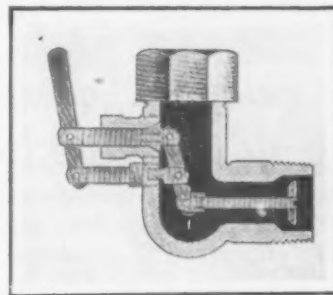
Discussion

The discussion revolved largely about questions put to the author. He pointed out that as duralumin in cast form required dies, it would be necessary to have quantity enter into a contract to compete in price with bronze. It has no great advantage, he added, as a casting metal. Under a welding torch, the material behaved like alloy steel—that when it is possible both to work the metal and heat treat it, the original structural condition can be regained after the welding. He did not recommend using heat treated duralumin forgings much above 450 to 475 deg. Fahr. In machining, the material behaves much better when heat treated than when annealed, the latter tending to pile up on the cutting tooth being tough rather than brittle. Duralumin should not be used on mild steel shafts as a bearing metal but on hard shafts, it is satisfactory. It does not compare with babbitt metal but with bronze.

The Wisconsin Steel Works, South Chicago, Ill., has commenced the construction of a coal storage dock of from 75,000 to 100,000 tons capacity to serve its by-product coke ovens.

Safety Gage Glass Valve

An automatic valve for use with gage glasses of steam boilers and for use in piping systems as a safety



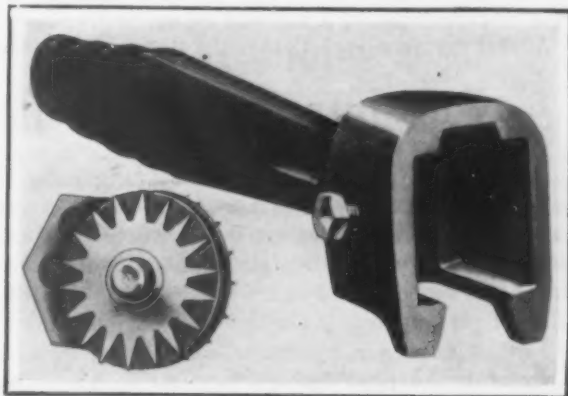
Automatic Valve for Safety

in the event of a breakage in the line has been put on the market by the Mattingly Automatic Valve Co., Inc., St. Louis. The accompanying sectional drawing will indicate its construction and method of operation. The main and auxiliary valves travel in opposite directions and cannot both be seated at the same time. The operating lever is for manual operation and its position indicates if the valve is open or closed. Movement of the operating lever may cause the main valve to move from its seat and the auxiliary valve to be seated. The pressure exerts itself against the auxiliary valve, holding it to its seat, and then should the gage glass be broken and the pressure be no longer confined, the auxiliary valve is relieved and the main valve is driven to its seat. No packing is used around the stem of the auxiliary valve.

New Grinding Wheel Dresser

A grinding wheel dresser, designed to avoid troubles arising from the wearing of bushings by the use of a new contrivance, is now made by the Desmond-Stephen Mfg. Co., Urbana, Ohio. The inner side of the jaws of the dresser, which is known as the Desmond-Hex, is channeled to receive a removable hardened hexagon nut in which are drilled six holes. These holes act as bearings for the spindle carrying the cutters.

When wear is shown in the hole the nut is removed by loosening the screw holding it in the handle. It is then given a sixth turn and replaced. This presents a new pair of holes for the spindle, and the process is continued until all the holes have been employed as



The Desmond-Hex Grinding Wheel Dresser Employs a Hexagon Nut Containing Six Holes for the Cutter Spindle, One to Be Used After the Other as Wear Requires a Change

bearings. Meanwhile the handle has received no wear and the hexagon nuts may be replaced.

The dressers are made in two sizes, one for use on ordinary wheels and the other for use on large and coarse wheels.

Criticism of Congress for its dilatory tactics in regard to taxation problems, was voiced at a luncheon given by John E. Edgerton, president National Association of Manufacturers, to the Cincinnati members on Oct. 14. Mr. Edgerton said that what the country needs most of all is to be told by Congress just what its taxes are going to be. James A. Emery, chief counsel of the association, also spoke at the luncheon, which was attended by approximately 400 manufacturers.

Threat of Railroad Strike Calmly Received

Iron and Steel Manufacturers Show No Excitement on Account of Threats—General Belief That Employees Could Not Succeed

THE announcement made in the Sunday newspapers that the leaders of the five large union organizations of railroad employees had ordered strikes of these employees to commence Oct. 30 to Nov. 3, so as to attempt to paralyze the whole railroad transportation of the country came as a distinct surprise. While it was known that strikes had been authorized, it was not deemed at all probable that the union leaders would take any radical step at this time, when large numbers of men are out of employment.

The feeling of surprise has not been accompanied by any excitement so far as the iron and steel interests of the country are concerned. In fact, telegraphic reports to THE IRON AGE from the leading manufacturing centers indicate that the possibility of a nation-wide strike is viewed calmly and there

is a general feeling that if there must be a strike, no better time than the present could be selected. In some circles there is a fear that a compromise which will not be satisfactory or enduring will be agreed upon.

The rapid increase in the use of motor trucks and the possibilities of using them to relieve conditions are frequently cited by those who believe that the strike would not be of long duration and would end in an early victory for the employers.

Perhaps the most gratifying news is that which comes from Washington indicating that the National Administration will take a firm stand back of the Railroad Labor Board. It is recognized that at the time Congress obeyed the demands of the labor unions in 1916 and passed the Adamson act to prevent a strike there was no labor board to which such controversies could be referred.

Some Increase in Demand Expected in Philadelphia

PHILADELPHIA, Oct. 18.—Some stimulation in the demand for pig iron, steel, coke and coal is expected this week if President Harding's efforts to prevent the strike of railroad workers do not promise success. The purchasing agent of one of the country's largest consumers of steel was here yesterday in an effort to speed up shipments of steel and to place other orders to forestall any stoppage of work at his plant by reason of a shortage of raw material. Generally, however, there has up to this time been little increased demand because of expectation of a railroad tie-up.

Almost everyone expects that the strike will in some

manner be averted, though there are many who declare frankly that a culmination in a strike of existing differences between railroad executives and workmen would not be such a calamity as it is pictured in the daily press. The feeling is general that railroad employees are now a favored class and their wages must be liquidated to a point in harmony with what men engaged in similar activities are paid to-day, this feeling being based largely on the premise that railroad freight rates must come down as a prelude to a return of prosperity and that liquidation of wages is an essential corollary of freight rate reductions.

Pittsburgh Not Excited About Strike Prospect

PITTSBURGH, Oct. 17.—It would be exaggeration to say that the possibility of a railroad tie-up, as threatened by the railroad labor unions, is viewed with only academic interest in the iron and steel and allied industries, but if there is real concern over this eventuality, it is not yet apparent. Uneasiness would be sure to crop out, if anywhere, in the fuel market; for it would be necessary for blast furnace interests to accumulate a reserve supply of coke, if for no other reason than to be able to bank the furnaces and thus escape the expense of blowing out and in, while coal obviously would have to be stocked if boilers and by-product plants were to be kept warm, even assuming temporary plant suspensions. It is the experience of important coal and coke interests here that as yet consumers are not seeking additional tonnages, and efforts to induce purchases on the basis of the possible transportation tie-up have not been successful. Pittsburgh would suffer little from a railroad strike in the matter of coal supplies for the reason that enough could be moved in by water to at least keep the plants going.

There is no scramble on the part of melters of iron to speed up shipments or to make fresh purchases to meet the possible exigency. Rather, the pig iron producers are finding melters more concerned in trying to get prices down because of the recent ore freight

reduction. What is true of pig iron is largely true of scrap, in which there is a notable lack of any nervousness on the part of consumers. There is no rush of orders with the steel makers because there may be a suspension of railroad operation. The explanation is simple. If the steel works and foundries cannot get raw materials in, they cannot, of course, get the finished products out. Moreover, jobbers and consumers feel that if there is no strike, freight rates will be cut and they will benefit, while manufacturers hesitate about filling up their customers at current prices and freight rates because of the reaction against them in case there proved to be no occasion for the loading up. The dilemma is two-horned.

The industry, by and large, is taking the strike prospect calmly. It is generally the opinion of the trade that if the railroad union leaders are so blind to the best interests of the country as a whole as to order the strike, the worst that could happen would be a tie-up of only brief duration, and this is regarded a better time to settle the issue of whether less than 1,500,000 men shall dictate to the other 105,000,000 people of the country than if business were normal and it were very essential that materials be moved quickly. It is no secret that railroad officials are indifferent to the strike and some actually would welcome it, firm in the belief that the men would be beaten and thus hasten

the end of present conditions, which give the unions the whiphand in the operation of the transportation arteries.

Another reason for the apparent calmness is a belief that there will be no strike. Presidential interference means that the union and railroad officials will be brought together and many observers are confident that

an amicable settlement will be reached. The railroad officials are not entirely free from responsibility in the development of this crisis, for instead of first reducing rates and then wages, they have sought to cut wages first. The steel industry cut prices before it cut wages, and the railroads could well take a leaf from the steel companies' book.

Thousands of Motor Trucks Available at Detroit

DETROIT, Oct. 18.—Although the feeling in Detroit is decidedly sceptical as regards the probability of a railroad strike on the scale that is announced, nevertheless the city is marshaling its forces against the possibility of a general tie-up.

Between 4000 and 5000 motor trucks owned by members of the Detroit Transportation Association stand ready to haul foodstuffs and other necessary freight in and out of the city over a radius of at least 300 miles. Besides this there are nearly 40,000 commercial vehicles of all kinds in the city that will be available to some extent for intercity hauling.

The Detroit, Toledo and Ironton Railroad, Henry Ford's line, will not be affected by the strike and is preparing to handle Detroit's coal supply during the period of strike.

The Detroit United Railway electric lines are preparing to handle the city's milk supply. An additional resource in this respect is the Canadian railroads which terminate in Windsor, Ont. According to competent authorities, the city has at least two weeks' food supply in storage and also two weeks' coal supply, for all purposes. It is estimated that the price of coal in Detroit would probably reach \$30 a ton if the strike should be a protracted one.

According to industrial authorities of the Detroit Employers' Association and the Board of Commerce, the factories would be forced to close down in three

or four days after the walk-out, this because of lack of materials. While a majority of the Great Lakes boats are now laying up, a railroad strike would cause the return of most of them for a period as long as good weather lasts. The only class in Detroit which appears to believe that a railroad strike is imminent is that of the railroad officials. It is stated that until last Saturday they scouted the idea of a strike, but to-day found them mostly inclined to believe that it would take place, although perhaps not on as great a scale as the employees announce. The general public appears to feel that the strike would be so unpopular that the rail employees would lose more by it than they would gain.

All agencies within the city, such as the Board of Commerce, Transportation Association, Employers' Association, etc., are preparing to do everything in their power to help break the strike. According to transportation men, it may prove desirable to establish a centralized truck transportation directorate. This work would probably be handled through the Detroit Board of Commerce.

Out in the State, the general feeling is much the same as in Detroit, according to newspaper dispatches. Nearly all of the industrial cities report that industries for the most part have at least a ten day supply of coal, and in some towns even a month's supply. The wide growth of truck transportation in Michigan is taken as an indication that the situation will be handled without the difficulties that the rail employees predict.

St. Louis Preparing for Emergencies

ST. LOUIS, Oct. 18.—The furnaces of the St. Louis Coke & Chemical Co., the only producer of pig iron in the St. Louis industrial district, are banked, but they are preparing for any emergency by taking in as much coal as possible, adding to a very liberal stock already on hand. The National Enameling & Stamping Co. is going right ahead with its operations, which are now

within 40 per cent of normal, and will be prepared to continue operations at least two weeks after a strike is called. It has ample storage capacity. It has its own locomotives, and is preparing to use motor trucks to make delivery to its two other plants in the district and to nearby customers. The Commonwealth Steel Co.'s business is confined to railroad work, and it does not expect to be affected.

Believe Suspension Not Unmixed Evil

YOUNGSTOWN, OHIO, Oct. 18.—While steel manufacturers of the Mahoning Valley do not view with anxiety the threatened strike of railroad workers, they say a tie-up of the country's transportation would compel them to close their plants. They believe the probability of the strike taking effect is not so great as would appear, and if it should materialize, it will be of short duration. Members of the brotherhoods will be slow to act in a movement that will deprive them of seniority rights, which they have worked years to establish, it is declared; furthermore, they will be deterred by the fact that many unemployed are waiting to step into their places.

"A strike would undoubtedly cripple the district," states a leading independent executive. "We would be paralyzed in the matter of getting in fuel and rail mate-

rials and shipping finished products. There would be but one thing to do, suspend."

"It might be a good thing for the steel industry to suspend for a time. While suspension would not reduce our overhead losses, it would cut down operating losses which most steel companies have been sustaining for the past few months at prevailing price levels. Financial reports show that most steel producers have been losing heavily.

"Maintenance of steel operations for any period whatsoever is largely dependent upon transportation and any interference with transportation and especially with the movement of fuel will halt production. Some finished steel could, of course, be moved in motor trucks, but this has not proved practicable for long hauls.

"There is no question that the railroads should re-

duce their rates. If the railroad employee is compelled to accept a cut in wages, the railroads should respond with a reduction in freight charges, and that at once. Readjustment of business and industry demands such changes and the consumer should get the benefit in cheaper hauling charges. There is little we can do to

protect ourselves against a railroad strike because transportation is so vitally essential to steel plant operations. But I hardly believe the railroad brotherhoods will throw the country into a turmoil, when public sentiment is so strongly for readjusted levels in all lines of activity."

Barge State Canal Would Help

BUFFALO, Oct. 18.—Buffalo district producers of pig iron and steel products are facing the railroad strike prospect with less worry than interests in some other centers. The availability of the New York State barge canal as a shipping medium to the East and convenient lake transportation to points west would do much to relieve the situation until freezing weather prevented. Central and eastern New York buyers would be served by the canal. Difficulties growing out of the use of the canal by virtue of the fact that consumers are not in close proximity to the State waterway would be met by the use of trucks. Use of the canal has not been popular this year because of the availability of cars and the switching necessities lacking where boats are used, but in general the district will not suffer complete idleness.

Shipping of pig iron and some other products was

accelerated on receipt of instructions to furnaces today. One interest was advised by two of its heaviest buyers of pig iron to double quantities placed in transit daily. Sufficient time has not elapsed in the opinion of selling interests for buyers to have taken action. For that reason and also because of a general belief that the strike will be averted, there has been no rush of orders for material. With the majority of interests there is sufficient raw material on hand to permit operation without interruption for a number of weeks. One pig iron producer found it expedient to defer shipment of ore by water pending the new rate becoming effective. This is taken to indicate that this interest would not be embarrassed by a long drawn struggle involving a tieup of the roads. Lake navigation is open until December at least and weather conditions at that time becomes the governing factor.

Alabama Well Prepared for the Strike

BIRMINGHAM, ALA., Oct. 18.—Iron and steel producers display no special uneasiness over the threatened railroad strike and are doing little in the way of anticipation. Furnace interests are well provided with stock of ore and coal accumulated during the non-production period. These stocks were greatest on record Oct. 1. A prominent producer said to-day: "The railroad workers could not have chosen a time to strike better suited to Alabama iron and steel interests. The furnaces least advantageously situated can operate six weeks without taking on new raw material. One large iron interest assembles all its material on its own property with its own motive power. This and another iron producer can exchange raw material with their two connecting lines. As for us, I see no occasion for unusual process other than to increase coal output."

A large iron operator said he has not given the matter a thought because it was not a pressing matter. Local iron and steel consumers are not worried over operations, because they also have large stocks. As a rule, they can get steel direct from mills by truck, if necessary.

A protracted strike would have injurious effects, they admit, but no interest seems afraid of the first month or six weeks of the strike. The Atlanta, Birmingham & Atlantic will not be affected by the strike and that will help. A canvass of commercial producers and consumers failed to elicit any note of special anxiety. The only nervousness extant was among coke consumers who are ordering shipments anticipated. A few small iron consumers are doing the same. They are from a distance.

Administration Will Take Firm Stand

WASHINGTON, Oct. 18.—While making no attempt to minimize the effect of the railroad strike should it actually come, there is a growing conviction that it will be avoided. An undertone of confidence prevails among Government circles that preparations through co-ordination of departments already made give assurance that even if the strike orders stand, transportation can be maintained on a basis that will practically meet demands. Attention will be given primarily to the movement of mails, foodstuffs, fuel and clothing, but also will be directed to shipments of raw materials and manufactured products of industries. This belief in the ability of the Government to handle the situation is heightened by claims of railroad operators that service can be maintained and the latter apparently reach this conclusion through the impression that if the strike comes, 40 per cent of the workers will decline to go out, among them skilled employees, such as many engineers, who, it is argued, would be unwilling to forgo seniority and pension rights that would be lost if they

threw up their jobs under the circumstances.

In view of the present condition of unemployment, it is claimed that those going on strike could be replaced in large part and added aid given by motor service by use of 33,000 Government trucks now available and airplanes, which would be employed most extensively in carrying necessities of life and mails. There can be no doubt that any attempt to interfere with transportation in any form would be dealt with sternly by the Government. It is equally as certain that the Administration is solidly back of the Railroad Labor Board. It is felt that the test may be at hand as to whether this agency, created by the transportation act, is a helpless organization whose findings may be disregarded at will by either labor or railroad interests. Aside from authority to cite either side for refusing to abide by its decision, the board has no arbitrary power, but rests its strength in public opinion and organized society. Because of the threat of the railroad brotherhoods to strike by reason of the 12 per cent

reduction in wages authorized by the board last July, labor has put itself in an untenable position and lacks public sympathy. The declaration of a strike merely on the announcement of the railroad executives to apply immediately to the board for a further reduction of 10 per cent in wages and to pass the benefit to the public in the way of a cut in rail rates, is accepted as ignoring the board by proposing action before it has an opportunity to pass on the application.

At the same time, irritation is felt toward the railroads for taking the adverse attitude toward the proposal of the public group of the board that the rate reduction be effected immediately and further wage reductions be subject of review. However, readiness of the brotherhoods to meet the Labor Board in Chicago Thursday had a favorable effect in Administration circles and increased the hope that the strike would be averted. But regardless of the attitude of either brotherhoods or railroads, strong reason exists for the belief that this procedure will be adopted.

Reports have come from authoritative sources that a rate reduction of a widespread, if not general character, is about to be ordered by the Interstate Commerce Commission. This would mean that transportation costs would be lowered more than those made before the labor board had passed on the application of the railroads for a further cut in wages. It is claimed that this proposal, reflecting the opinion of the public group of the Labor Board, was approved by the Interstate Commerce Commission at conferences here and was recommended to the President and received his sanction. What the prospective rate cut would amount to is not known definitely, but it is reported to range between 10 and 15 per cent. Because of the financial condition of carriers, it is thought this would eventually mean further wage reduction. With the wage cut of 12 per cent in July and with the proposal of the railroads to make a further cut of 10 per cent, this would wipe out 22 per cent of the wage increase in 1920, should the 10 per cent cut be effected.

Cincinnati Views the Situation Calmly

CINCINNATI, Oct. 18.—The possibility of a railroad strike on Oct. 30 is being received calmly by the business interests of Cincinnati. Official recognition of the possibilities is being given, however, and steps are being taken to organize to meet any eventualities. According to fuel dealers, the city is well supplied with coal and coke to meet any conditions, and with the Ohio River transportation facilities available, there is little danger of a food shortage.

The iron and steel industry will be little affected. The metal working industries are running only approximately 20 per cent of normal, and stocks of iron, coke and steel products are sufficient to take care of all needs for some weeks in the event that a strike becomes effective. A canvass is being made of the possibilities

of shipping by motor truck to inland towns and steamboats to points along the river, and if necessary, transshipment by motor vehicles. No figures are available as to the quantity of gasoline in storage, but estimates made are that with conservation measures effective, there will be sufficient to keep the wheels of industry turning at their present rate at least.

The feeling is general, however, that a strike will in some way be avoided, and for that reason no actual preparations are being made as yet to meet the situation. Steel mills operating in the territory report that no steps will be taken to move their products in case of a strike, though consumers within a radius of 50 miles will probably be kept fully supplied by the aid of motor trucks.

Not Taken Very Seriously at Chicago

CHICAGO, Oct. 18.—The strike threat of the railroad brotherhoods has not been taken seriously by producers and consumers of iron and steel in the Chicago district and no especial preparations are being made to meet any situations which might arise in the event of a walk-out. It is not believed that the unions actually expect to carry out their program, but that in some way they will find a valid excuse for changing their plans. It is felt that they are cognizant of the fact that public sentiment would not be behind them and that many shippers would actually welcome any inconvenience and loss which might result from a transportation tie-up for the sake of having a decisive settlement of the issues involved. It is pointed out that, if a strike comes, it will take place at a time when it will do the least harm to industry, as current business is still far below normal.

Producers are well stocked with materials so that they will be able to operate if they find that they can continue to ship some of their finished products. Users likewise are not worrying about supplies. Forty foundries in Chicago and immediate vicinity are well stocked with coke and have sufficient iron to keep them running at the present rate of operations for several months. They are not worrying about deliveries of castings, as they all have motor trucks which they can use to move their products to customers in Chicago and surrounding territory.

In railroad circles, opinion is divided as to the prob-

ability of a strike. It is generally agreed that the unions do not want a strike, but at the same time it is believed that neither the men nor the managements will alter their positions, unless the Government interferes. It is no secret that the railroads hope that the strike will come so that they can free themselves once and for all from the incubus of a heavy wage burden and a maze of working agreements which blocks all their efforts in the direction of greater operating efficiency. That the Government will probably use every influence to forestall a strike, as anticipated in railroad circles, is indicated by the fact that the Railroad Wage Board has invited the brotherhood heads to a conference at Chicago on Oct. 20.

In some quarters the possibilities of a coal strike are regarded as less remote than those of a transportation tie-up. On Oct. 28 Federal Judge Anderson at Indianapolis will render a decision which will definitely determine the status of both operators and mine union executives who were indicted about a year and a half ago. The indictments not only bring into question the legality of the wage agreement between operators and miners but challenge the check-off system without which it is believed the unions could not exist. A walkout by the miners in the event of an unfavorable decision is expected by the operators. On the other hand, industrial users of coal feel that conditions are not right for a successful strike and that the union executives are well aware of the fact.

Machine Tool Builders in Convention

Cost Accounting, Standardization and Statistical Service for the Industry Are Chief Topics at the New York Meeting

THE National Machine Tool Builders' Association opened its twentieth annual convention at Hotel Astor, New York, Tuesday morning. Only a partial report of the opening sessions can be given in this issue.

There was a fairly large attendance.

August H. Tuechter, president of the association, in his opening address, said in part:

"In welcoming you to this convention, I do so with the solemn feeling that I am called on to preside at the most important annual meeting the association has yet held. Since last year we have been passing through a period of dullness that is the worst we have had since 1893, and in proportion to the present capacity of the industry is very much worse than any we have ever had. We had four years of false prosperity, due to the war, when our industry was called on to increase its capacity and output far more than we ever dreamed possible. How well it met the call is a record to which we can point with pride.

After the armistice we had a slackening in business which we rather expected, but to our surprise another period of false prosperity began in 1919. However, this did not last long because new orders fell off from January, 1920, and kept slipping down until July, 1921, after which August developed a slight up-turn which however did not continue during September.

"As this depression came on us, I believe that most of us felt that it couldn't last long nor be very bad. An industry that has had seven slumps in 21 years ought to have its eyes open and be ready for one almost any old time.

"Now, then, let us not make this same mistake again. We have a thoroughly competent observer on watch [the new general manager of the association] who will warn us of shoals ahead and of clear sailing, of the rise and fall of our business barometer. Let us now do the things necessary to help him correct and revise our barometer. It is ours—for all of us—but some don't know it even exists. Some prefer to sail without it. Some will not help, either through lack of knowledge or fear of damage to their own craft.

Waste in Industry

"As the members know, before his selection as Secretary of Commerce, Mr. Herbert Hoover, as chairman of the American Engineering Federation, asked a committee of distinguished engineers to estimate the amount of waste in industry, the object being to call the public's attention to the sources of waste and to arouse industry to the necessity and profit of eliminating waste.

"Fred J. Miller, former editor of the *American Machinist*, was active in this committee and asked the association's assistance in making some studies of the machine tool industry. This assistance was given, and the investigation seemed to show a probable waste of about 40 to 45 per cent. The report of the committee is very interesting, and it shows that in the machinery industry not a large proportion of this waste can be chargeable directly to labor restrictions; therefore, the responsibility for elimination of waste in the machinery business rests largely on the shoulders of management.

"There is a very large excess of facilities that are not used to the fullest extent. There is badly planned management. Efficient planning and guidance of production is the duty of management. Better employment service and policies lie within the power of management, and not of the employees.

"The old proverb says that a dollar saved is a dollar earned, and I recommend to our members that we our-

selves look to every opportunity to save waste in our own shops—wastes of every kind in plants, in time, material, organization, and costs.

Work in Cost Accounting

"Since our Cleveland meeting, Scovell, Wellington & Co. have made cost surveys for a number of our members. The cost work of the association should be continued until the members are all found to be figuring the proper elements of cost. Unless they do so they have a false basis on which to base their prices. The man who does not charge enough into his costs is very prone to make mistakes in his prices, and his cost system should automatically provide for the proper charges. Most of our men can easily get their labor and material, but the burden distribution is the part of cost-keeping that presents the most difficulties, and many people are inclined to neglect it just because it seems too difficult.

"Those members who have not yet had the survey made of their plant should do so, and should consult with the accountants as to what parts seem to be deficient in their system to bring it in line with the uniform plan adopted by the Cleveland convention.

"If all of us had used the device of calculating a normal burden, and putting away cash reserves in boom times to carry over depressions, our industry would be in a much healthier position than it now seems to be. Several members have written that they could not spare the money it would cost to attend this convention. Is that not evidence that there is a necessity for some of this cost accounting work?

Statistical Service

"The most promising, the most necessary activity which the association has undertaken this year is the organization of statistical service for each group of tools for which it is possible to render such service.

"The chart displayed here shows the very great irregularity to which this whole industry is subject, and this excessively high war peak certainly is significant. If the law of action and reaction applies in business as in physics, the industry seems due for a very long reaction to compensate for the excessively lively action that we had during the war.

None of us can judge our wisest course merely from our own experiences with anything like the soundness we could have by pooling our information through a statistical service. Other trade associations find this to be the most valuable service they can render their members, and I personally am fully convinced of that fact. The whole world gains much from the monthly reports of output that the iron industry has published for many years. All industry is closely related, and by proper study and interpretation of conditions, it will be possible to better stabilize industry, to have ready for the consumer all the goods that he needs, and not to have an excess of goods when the consumer is not likely to need them. The lone manufacturer confronted with such a business situation as we have now is groping blindly if guided only by his own knowledge. He is much more subject to losses than if he had full information as to the total current output and sales of his particular product, together with reliable information as to finished stock on hand, the amount in process, and the rate at which this stock is moving out. It is very valuable when these items are compiled, to compare one's own experience with the consolidated figures for the whole group. Each can determine how his own sales compared to those of all other producers as a group, and how far he is justified or not justified in making special sales efforts.

"It is of the greatest value at this time for each group to take its shipments for the last 20 years, as some groups have done. We are thus able to form a pretty fair conclusion as to the pre-war trend, and in the light of that, to plan intelligently our policies in the future. This composite curve before you is significant, but is not as valuable as the group curve showing your own products. Then with the monthly reports and charts for each group, the actual flow of business in the group is very well seen, whether it be good or bad. Without it, you can only guess; with it, you can reasonably estimate.

"Our own statistics of this sort can be made of great value to the country because indications are that our own slump in any period of depression precedes a general business slump by some months at least, perhaps by a year. In exchange for this information from us we can hope to secure similar information from other industries whose activity precedes ours on the rise. Then we will know the right time to make stock and to get ready for the prosperity that will occur during the following cycle.

"Such co-operation between industries depends on co-operation between individuals in each industry. Such work cannot be done by any individual alone. In such co-operation lie great possibilities of benefit to all members of a group.

Regional Meetings

"A promising innovation in the association's work has begun this year by holding two series of regional meetings. One series, conducted by Mr. Scovell of the Scovell Wellington & Co., discussed our uniform cost plan, and the second, conducted by our general manager, discussed general conditions in the industry. Letters that came into the office commend the work in these meetings in the highest terms.

"The work of an association must necessarily be informational—that is, it must gather and spread information. Regional meetings should be a part of our program from now on. At these meetings not only should the heads of the concerns be present, but they could well have present the men known as junior executives, who are in responsible positions, and who gradually grow up to be heads of concerns. The education of such men in the broader aspects of this business can have only a good effect. The principles and the difficulties underlying the development of this industry might well be laid even before the workmen, who are prone to think that the bosses never have any troubles.

"There are many possibilities in these regional meetings and they can well be developed.

Standardization of Tools

"For many years this association has talked about the possibilities of standardization. The time now has come to stop talking and go to work. The American Society of Mechanical Engineers has taken up a number of subjects that directly concern the machine tool builder, and we shall have to be represented on committees on these subjects.

"A recent letter from Sol Einstein, chief engineer of the Cincinnati Milling Machine Co., who is now in Germany, says that the German machine tool builders are very busy with standardization work. I do not need to go into this in detail. You know it is needed, for many reasons, and each committee should seriously and promptly formulate opinions as to what things can be standardized and then go into the work of standardization itself.

"The general plan could be to have a general committee of the association which can make recommendations to the Engineering Standards Committee. Each machine group should have a special committee on standardization which would report its findings to our general committee, for transmittal as above mentioned. This is the practice of other organizations. We should take our proper position on these matters. If we do not do this work ourselves as affecting our own interests, we will have no just cause for complaint if some others attempt to do it for us and then do it badly, for lack of understanding of our problems.

"We should not let the matter lie as we have heretofore, but we should make this a very vital and active part of our association program. It will finally be a very profitable undertaking, as has been demonstrated with standardization work in other fields.

The New National Office

"I consider it necessary that I at this meeting of the association make some reference to the National Association office which has been open in Cincinnati since Jan. 1, 1921. To get the office into shape, properly equipped and running, was naturally the first task which confronted Mr. DuBrul, and with this accomplished he went to work with a vim and vigor which must be seen to be appreciated."

Ernest F. Du Brul, the new general manager of the association, commented as follows on the work which the organization is doing and can do to make its work of the greatest effectiveness for the members:

"In the 20 years of its existence the National Machine Tool Builders' Association has done good work, but compared to much younger associations, its activities have been limited. Many activities now successfully pursued by other organizations can well be followed by this association. The necessity of other work besides good fellowship and acquaintance among competitors, has led many trade organizations into much more active work.

"The Machine Tool Builders' Association has done extremely well, in the matter of cultivating good fellowship and confident knowledge that the word of one's competitor was good. When the association was organized a machine tool price list meant nothing except the salesman's maximum limit; to-day, in spite of the depression that exists in the business, a machine tool price list means just what it says, in the vast majority of cases. The ethical standard of the machine tool business on that one account is vastly improved over what it was 20 years ago. Such a betterment of ethics would not have been possible without the good fellowship and confidence that this association has brought about among competitors.

"The association's co-operative work of the past should not be minimized, but now the conditions are such that unless co-operative work of a much higher type be undertaken in more and newer ways, the association will fail of reading its highest value to the membership, who are paying for its operation.

"I have tried to make it plain in bulletins, in the regional meetings, and in the Cleveland convention, that association work should be regarded by the members as a strictly business proposition. The association will be more and more successful the more the members do so consider it. They should weigh its worth to them against the dollars they pay out for it. Unless they do so look upon it, they will not co-operate in the things that they are asked to do. Those who seriously regard the association office as just as much a part of their every-day organization as though the association office were under their own roof, will co-operate to the fullest extent, and will be repaid many times over.

"The economic upset the world has been going through and the present depression in the machine tool industry require real service along economic lines. This is no time for puttering with business problems. On the other hand, it requires of every man the deepest thought, and most serious study, if he would keep his own business and his industry in a healthy condition.

Statistical Work for the Various Groups

"It is well demonstrated by many trade associations that the most valuable service that can be rendered is to gather and distribute statistics of production, shipments, stocks and sales. Without information of this sort, each manufacturer must simply grope blindly in the dark, making the wildest kind of guesses as to conditions that he must meet. The poorer his information of a general situation, the worse his guess is likely to be.

"Every man wants to know and should know whether he is getting a fair share of what business is going at any time. He can tell this only if he knows

the total volume in his line being sold in a month. If he knows that the present state of demand is only 50 machines a month, and if he knows that he is getting his share of that limited demand, he will not be tempted to do things that compel his competitors to enter cut-throat fights for business. But if he is ignorant of the true facts he is pretty sure to do something that will work against his own pocketbook, and everyone else's, including the consumers'.

"In no other way can he know, except by joining with his competitors in compiling a composite report of the conditions. When he has that report he can then set his own conditions up alongside not only of the condition of the group as a whole, but of his competitors as a whole with himself excluded.

"To develop that sort of information for each group, we are organizing monthly statistical services by groups, of orders, cancellations, production, shipments, factory stocks and dealers' stocks. The shaper, radial drill and upright drill groups have already put this regular service into operation.

"One reporting group found that of certain sizes of machines the factory and dealers' stock is sufficient to supply demand, at the current rate, for something like 36 months. Can any man think that to be a healthy condition? Remember that those stocks were accumulated at high costs, and now have to be liquidated in the face of much lower replacement costs. The difference in cost went to the workers and the material men, but it will never come back into the bank accounts of the men who accumulated those stocks in over-anticipation of their demand. If they had had this sort of service in the last two years they would have real money in good, select investments bearing high rates of interest and increasing in value. Instead, they have it tied up in stock that not only earns no interest, but costs interest to carry, and besides creates loss and demoralization, as overstocking always will do in every industry.

"Is it not plain that when an industry as a whole provides far more production capacity than the demand of its customers justifies, that industry is not going to pay a reasonable rate of return on the investment so made? True, some individuals in a group might generally be able to earn a fair return on their own capital, but when demoralization of price occurs, because of blind guessing on the operation of economic forces, even sound, well-managed concerns cannot hope to make the earnings that their efforts and capital at risk really justify. This does not mean that there shall be any conspiracy or agreement among competitors, but it does mean that each competitor, individually, can know the true condition, and knowing it will be able to keep his own business in sound condition. Naturally, if all, or a great majority are doing the right thing, the industry as a whole will be healthy; but if a majority are doing the wrong thing, all will suffer.

Barometer of Trade

"The barometer chart figures that we have been issuing every month are far from being as satisfactory as they can be made. As I have said at the group meetings, a feather thrown into the air will indicate the wind's direction better than nothing at all, but it would hardly serve the weather bureau, to measure and record wind velocity and direction accurately enough to predict the general course of the weather.

"From various curves drawn to show shipments of the past twenty years of different sizes of various tools, we can now say that this industry can construct a first-class barometer for itself, if it wants to. This can be done, and at slight cost, but it will require co-operation by the members. Such a barometer can and should be made for each group if the group statistics are better organized and better appreciated. In addition, a general barometer can and should be constructed for the industry as a whole, and it can be done very easily.

"Our member, Mr. Oesterlein, made a suggestion that I believe will greatly improve the general barometer. That suggestion is, that each member report unit orders received each month, giving the number of machines ordered and canceled, and the balance of unfilled orders, the report blank being arranged to show the value of

machines sold in classes according to a scale of values to be decided upon.

"It is fairly evident that the lighter machines are most sensitive to rising demand because they do not require buyers to make much cash outlay, and such types naturally are the greatest in numbers sold every month. We have now sufficient evidence on which to base a fair presumption that as the lighter machines precede the heavier ones in activity on a rising market, the heavier ones show a slump coming long before the lighter ones do. Therefore the interests of builders of heavy and light machines are mutual in having information as to the course of the general market from month to month.

"As a basis of discussion, it is suggested that reports be taken, as follows:

- (a) Machines sold to the consumer at \$300.00 or less
- (b) Machines sold to the consumer at 300.00 up to \$800.00
- (c) Machines sold to the consumer at 800.00 up to 1,500.00
- (d) Machines sold to the consumer at 1,500.00 up to 2,500.00
- (e) Machines sold to the consumer at 2,500.00 up to 4,000.00
- (f) Machines sold to the consumer at 4,000.00 up to 6,000.00
- (g) Machines sold to the consumer at 6,000.00 up to 10,000.00
- (h) Machines sold to the consumer at over \$10,000

"Curves of each of these classes would clearly show the trend of business. Low interest rates precede activity in pig iron production, with which we now know the machine tool demand to be closely correlated. With such curves we will then be in a fair position to forecast the movement of machine tool demand.

"If we find the small machines becoming active, we can send out to the whole industry the glad tidings that the clouds are breaking. We know that long before a general boom is at its height interest rates go up and the heavy types of tool fall off in demand, for very well known reasons. When we find this to be showing up, we can hoist a storm signal for the industry, so that all can reef sail.

"If the members will take the very little trouble required to make the reports, the association can easily give all a fine service, at a cost that is negligible compared to the benefit. I strongly recommend that some action be taken along this line, the change to be effective beginning with January next. This would give the members time to get their records in such shape as to enable them to report on whatever basis is adopted."

[Report to be concluded in the issue of Oct. 27.]

Engineering Meetings

Clean cold producer gas from bituminous coal is to be discussed by C. F. Kaufman, gas engineer, Atha Works, Crucible Steel Co. of America, at a meeting of the Metropolitan Section of the American Society of Mechanical Engineers at the Public Service Terminal Building, Newark, Oct. 28. At 3 p. m. in the afternoon an inspection trip is to be made through the Harrison, N. J., works of the Crucible Steel Co., followed by a dinner at 6 p. m. at the Downtown Club, Kinney Building, Newark.

The Indianapolis section of the American Society of Mechanical Engineers is to hold a two days' meeting on Oct. 28 and 29. Among the papers announced are the following: "Stellite Metal and Its Application to the Arts," by Elwood Haynes, Kokomo, Ind.; "Steam as a Motive Power for Commercial Vehicles," by Fred Hamilton, Indianapolis, and "Acid Resisting Alloys—Research Work Covering Non-Ferrous Metals in Its Application to Their Acid Resisting Properties," by George A. Drysdale, Indianapolis. On the second day the engineering buildings and equipment of Purdue University are to be inspected.

The Cleveland section of the society will hold a meeting on Nov. 1 at the Hotel Winton, at which an address is to be made on "Die and Mold Making" by James K. Keller, Keller Mechanical Engraving Co., Brooklyn, N. Y.

The Buffalo section of the society will hold a meeting at the Lafayette Hotel, Buffalo, Nov. 2, at which an address on "Progress in Mechanical Engineering Research" will be made by Prof. Arthur M. Greene, Rensselaer Polytechnic Institute.

PLAN PIG IRON CONTRACT

Purchasing Agents' Association Draws Up Model Form Now Under Consideration

A standardized form of pig iron contract was presented at the annual meeting of the National Association of Purchasing Agents held in Indianapolis last week and will be submitted to producers with a view of securing their approval of the new form. The standard contract form was presented during a conference on iron and steel, the session being presided over by S. L. Plimpton, purchasing agent Wellman-Seaman-Morgan Co., Cleveland, chairman of the steel committee of the association and chairman of the pig iron contract committee of the Ohio State Foundrymen's Association. The Ohio association, together with the Chicago District Foundry Operators' Association, Foundrymen's Association of Chicago, Foundrymen's Association of Wisconsin, Foundrymen's Association of Michigan and Foundrymen's Association of Connecticut are co-operating in efforts to secure a standard form of pig iron contract. Pig iron consumers claim that in contracts used by some producers the buyers' rights are not protected to the same extent as those of sellers in respect to cancellations and to rights to delay in accepting shipments, and the standard form submitted is intended to better protect the buyers' rights.

1. Terms of Payment:

Invoices shall be paid on or before the day of each month for all shipments made during the preceding calendar month. Noncompliance with said terms of payment shall give the seller the right to suspend further shipments until all previous shipments are paid for, and if in the judgment of the seller the financial responsibility of the buyer shall at any time become impaired and written notice thereof be given by the seller to the buyer, the seller shall have the right to suspend further shipments until adequate security for payment hereunder is furnished by the buyer. If such security is not furnished within 30 days from such notice, the seller shall have the right to cancel this agreement.

Unless otherwise written in this contract, or point of delivery is f.o.b. cars at destination, all freights are for the account of the buyer, including all revenue taxes which have now or may be hereafter imposed upon transportation facilities and service by Federal or State Government.

2. Weights:

All settlements shall be governed by track scales at point of shipment. Buyer shall have access to scales, and the right at all times to inspect and examine them. Any errors in such scale weights when ascertained shall be promptly adjusted. In case scales of buyer should show a material difference, and the buyer proves within a reasonable time that the difference has been due to an error in the track scale at point of shipment, allowance shall be made for such difference; otherwise all claims for shortage shall be made by the buyer upon the transportation company, unless by terms of this contract seller has agreed to deliver to buyer f.o.b. cars at destination.

3. Contingencies:

Strikes, fires or accidents at the furnace or furnaces where iron sold hereunder is produced, embargoes, or other similar occurrences beyond the control of the seller (or his principal) which prevent or interrupt the shipment of such iron, shall excuse seller's failure to ship hereunder during the continuance of such occurrence, provided:

(a) The seller is the owner or exclusive sales agent of the furnace or furnaces at which the iron sold hereunder is produced, or prior to or simultaneously with the execution of this agreement has entered into a written contract for the purchase of a sufficient quantity of iron from such furnace or furnaces to fulfill the obligation of the seller under this agreement.

(b) The name of the owners and location of such furnace or furnaces are stated in this agreement:

(c) The seller gives the buyer written notice within five days after such occurrence of the exact nature, extent and probable duration thereof with sufficient detail to enable the buyer to verify the same:

(d) The total available tonnage of said furnace or furnaces during prevention or interruption of shipments as aforesaid is applied pro rata on all contracts then in force or any renewals thereof for the output of such furnace or furnaces exclusive of contracts or sales made after such occurrence.

Likewise, in case of strikes, fires, accidents or causes beyond the control of the buyer which wholly or partially stop the works of the buyer, shipments contracted for shall

be suspended or partially suspended as the case may require upon written or telegraphic notice to the seller.

4. Waiver by either party of any default by the other hereunder shall not be deemed a waiver by such party of any default by the other which may thereafter occur.

5. Notice sent by telegram or registered mail, addressed to the party to whom such notice is given, at the address of such party stated in this agreement, shall be deemed sufficient written notice in any case arising under this agreement.

6. No understanding, agreements or trade customs not expressly stated herein shall be binding on the parties in the interpretation or fulfillment hereof unless such understanding, agreements, or trade customs are reduced to writing and signed by the respective parties.

Terms and conditions in the contract now in common use read as follows: :

Sellers shall not be responsible for delays caused by strikes, differences with workmen, accidents at works, delays in transportation, car shortage, or any causes not under his control.

Each month's delivery to be treated as a separate contract independent of contracts for deliveries during other months.

In case of any default whatsoever of the seller in regards to installments herein mentioned, the buyer shall not by reason thereof be excused or released from any obligation in regard to other installments.

If the buyer fails to make any payment when due, the seller shall have the right to cancel the contract or at seller's option to postpone shipment of future installments until prior shipments are paid for.

Railroad scale weights nearest the point of shipment shall govern settlement.

The material bought and sold hereunder is for consumption at buyer's works specified.

Resolution Adopted

A resolution was adopted asking that producers and sellers of semi-finished and finished steel show in their invoices, the factors going to make up the total of the invoices, meaning particularly the various extras that are charged. Other resolutions urged reduction in freight rates and requested trade publications not now doing so to quote current prices on most widely used alloy steels and ferroalloys.

Rochester, N. Y., was chosen as the place of the next meeting, which will be held in May, 1922.

New Schedule for Manufacturers

WASHINGTON, Oct. 18.—Director of the Census William M. Steuart has issued the general schedule for manufacturers for the census of 1921 which was prepared in co-operation with the committee created at the July conference in Washington of trade and craft associations with Secretary of Commerce Herbert Hoover and officials of the census bureau. The schedule carries several revisions of the tentative schedule which had been sent out for study by manufacturers through the committee of trade and crafts organizations, of which Attorney Nathan B. Williams of the National Association of Manufacturers is chairman, and adopted changes suggested by it as well as by Secretary Hoover. Among the changes is the inclusion of the total salaries paid "salaried employees" and the total wages paid to "wage earners," which the committee had sought.

Because of its simplicity the new schedule differs from past schedules and also varies with regard to the amount of information called for. As outlined, the new schedule covers the following items: Names and particulars of establishments as to location and lines of products; persons employed as salaried employees, including managers, clerks, etc., and total salaries paid; wage earners, including piece workers, and total wages paid; time and operation and products which will be detailed for the particular industries.

The Caucasian manganese ore producers are understood to be holding a meeting in Constantinople, with a view of arriving at a method for the resumption of their export business but, owing to the many conflicting interests, the outlook is not particularly hopeful, says the *Metal Bulletin*, London, England.

Iron and Steel Markets

NO STRIKE FLURRY

Iron and Steel Markets Show Little Signs of Preparation

Weakness in Tonnage Products—Some Rail Releases—Expected Lower Freight a Factor

Producers and consumers of steel appear little disturbed by whatever prospect exists of a general railroad strike. On the one hand there has been no flurry of orders for prompt shipment; on the other hand the strike threat has not stopped buying for other than immediate delivery. Generally, the market has been quieter than in the past two weeks.

Some manufacturing consumers of pig iron and steel who could deliver their own product by trucks, in case of strike, have made an effort to insure raw material supplies. Perhaps in sheets more than in other rolled products mills have been asked to expedite deliveries. Wire nails, in which the final distribution is local, have also been called for in the same way.

In Chicago, Cleveland and some other foundry centers makers of castings are prepared to get iron by truck from local furnaces as well as to deliver castings to local customers. But such expedients would be temporary, as blast furnaces would soon be forced to stop for lack of coke.

The belief that in some way a strike will be averted accounts in part for the generally even tenor of the market. A greater influence than the strike threat itself is the practical certainty of freight rate reductions. Its effect is seen in some withholding of shipping orders.

On the side of operations developments are still favorable. In the Pittsburgh district steel plants are averaging about 40 per cent. At Chicago the largest producer has come up to 44 per cent this week. Two blast furnaces have been blown in this month by an independent producer at Pittsburgh; another has gone in at Youngstown, two at Buffalo and one in eastern New York.

In respect to prices the situation is little changed, plates and bars still tending to yield when a fairly good rolling is in sight. Where important tonnage is offered, bars can be had at 1.50c., Pittsburgh. The tin plate market is weaker and there is not the strictest adherence to the Sept. 12 schedule on all wire products. Price cutting on line pipe has been particularly sharp.

On the other hand two or three more independent sheet mills have quoted the \$5 advance announced recently by one maker, and manufacturers of hot-rolled strips, hoops and bands who have taken business at as low as 2c. advanced to 2.25c. on Oct. 15, customers being allowed first to enter orders on the old basis.

A Southwestern railroad which had held up shipments on a rail contract for nine months released 20,000 tons this week. Other releases include 8000 tons and 18,000 tons of rails and fastenings from two Western lines terminating in

Chicago. Otherwise railroads have had little to do with the steel market.

Fresh fabricated steel projects of size aggregate 10,500 tons and the awards of the week approximate 10,000 tons. September's rate of business, corresponding to 48 per cent of the capacity of the bridge and structural shops of the country, is being fairly well sustained to the gratification of the fabricating trade, seeing that the volume of business over the last twelve months has engaged less than 30 per cent of capacity.

The prospect of considerable buying by railroad shops is a more hopeful feature of the machine tool market. A list of 75 machines wanted by the Missouri, Kansas & Texas is a leading item and 40 machines are about to be closed for the Lackawanna. New York Central requirements of early 1922 are also being made up and other lines are about to come into the market.

Some foundries have requested that shipments of pig iron be hastened on account of the threatened railroad strike, but they are showing little anxiety. Sales amounting to 10,000 tons have been made at Cleveland and there has been fair activity at Boston and some other centers, but for the most part the market is extremely quiet. Only a few sales for prompt shipment are attributed to the strike situation. Several Southern furnaces are preparing to blow in on accumulated orders, including fair amounts from cast iron pipe foundries.

Dealers in steel scrap thus far have transferred to users little of the material accumulated in the recent speculative advance. In the Chicago district one substantial purchase has been made by a steel company, but generally steel works operations have not been on a scale pointing to heavy purchases of raw materials.

Pittsburgh

PITTSBURGH, Oct. 18.

The effect of the threatened railroad strike upon the demand for iron and steel has been contrary to what ordinarily might have been expected. Here and there foundries have sought to have shipments of iron, due them on orders, speeded up somewhat, and there also have been a few calls upon the coke producers for extra tonnages of foundry coke. These demands, however, have been from foundries not entirely dependent upon the railroads for the movement of their finished products. Generally the strike prospect has dampened the ardor of buyers and business as a whole has been quieter in the past week than it was in the two preceding weeks. The explanation is that very few people expect the strike to take place and if by some possibility it does occur, it would not avail buyers much to have material on hand when it could not be moved out. Producers have been loath to press supplies upon buyers because of the strike possibilities, in the fear that if there is no suspension of railroad operations, buyers would hold it up against them for having loaded them up.

No matter how the matter finally is adjusted, the belief is common here that freight rates are coming down, and to a degree this expectation is responsible for somewhat less willingness on the part of distributors and consumers to specify against orders they have with the mills.

Plant operations on the whole are better right now

A Comparison of Prices

Advances Over the Previous Week in Heavy Type, Declines in Italics

At date, one week, one month, and one year previous

For Early Delivery

Pig Iron, Per Gross Ton:	Oct. 18, 1921	Oct. 11, 1921	Sept. 20, 1921	Oct. 19, 1920
No. 2X, Philadelphia....	\$22.40	\$21.84	\$21.34	\$51.54
No. 2, Valley furnace....	21.00	21.00	21.00	47.00
No. 2 Southern, Cin'ti....	23.50	23.50	23.50	46.50
No. 2, Birmingham, Ala....	19.00	19.00	19.00	42.00
No. 2 foundry, Chicago*....	21.00	21.00	22.00	43.00
Basic, del'd, eastern Pa....	20.50	20.50	19.25	51.26
Basic, Valley furnace....	19.25	19.25	19.25	43.00
Bessemer, Pittsburgh....	21.96	21.96	21.96	48.96
Malleable, Chicago*....	21.00	21.00	22.00	46.50
Malleable, Valley....	20.50	20.50	20.00	50.00
Gray forge, Pittsburgh....	21.96	21.96	21.96	47.96
L. S. charcoal, Chicago....	31.50	31.50	33.50	58.50
Ferromanganese, del'd....	60.00	60.00	60.00	170.00

Rails, Billets, etc., Per Gross Ton:	Oct. 18, 1921	Oct. 11, 1921	Sept. 20, 1921	Oct. 19, 1920
Bess. rails, heavy, at mill....	\$45.00	\$45.00	\$45.00	\$55.00
O.-h. rails, heavy, at mill....	47.00	47.00	47.00	57.00
Bess. billets, Pittsburgh....	29.00	29.00	29.00	55.00
O.-h. billets, Pittsburgh....	29.00	29.00	29.00	55.00
O.-h. sheet bars, P'gh....	30.00	30.00	30.00	62.50
Forging billets, base, P'gh....	35.00	35.00	34.00	70.00
O.-h. billets, Phila....	35.74	35.74	35.74	60.74
Wire rods, Pittsburgh....	40.00	41.00	41.00	75.00
Skelp. gr. steel, P'gh, lb..	1.60	1.60	1.65	3.25

Finished Iron and Steel,	Cents	Cents	Cents	Cents
Per Lb. to Large Buyers:				
Iron bars, Philadelphia....	1.95	1.95	1.95	4.85
Iron bars, Chicago....	1.75	1.75	1.75	3.75
Steel bars, Pittsburgh....	1.50	1.60	1.60	3.00
Steel bars, Chicago....	1.75	1.75	1.75	2.73
Steel bars, New York....	1.88	1.98	1.98	3.63
Tank plates, Pittsburgh....	1.60	1.60	1.60	3.00
Tank plates, Chicago....	1.75	1.75	1.75	3.03
Tank plates, New York....	1.98	1.98	1.98	3.38
Beams, Pittsburgh....	1.60	1.60	1.60	3.00
Beams, Chicago....	1.75	1.75	1.80	2.83
Beams, New York....	1.98	1.98	1.98	3.48
Steel hoops, Pittsburgh....	2.25	2.25	2.15	5.00

*The average switching charge for delivery to foundries in the Chicago district is 70c. per ton.

†Silicon, 1.75 to 2.25. ‡Silicon, 2.25 to 2.75.

The prices in the above table are for domestic delivery and do not necessarily apply to export business.

Sheets, Nails and Wire,	Oct. 18, 1921	Oct. 11, 1921	Sept. 20, 1921	Oct. 19, 1920
Per Lb. to Large Buyers:	Cents	Cents	Cents	Cents
Sheets, black, No. 28, P'gh....	3.00	3.00	2.75	6.75
Sheets, galv., No. 28, P'gh....	4.00	4.00	3.75	8.25
Sheets, blue an'd, 9 & 10....	2.25	2.25	2.20	5.00
Wire nails, Pittsburgh....	2.90	2.90	2.90	4.25
Plain wire, P'gh....	2.60	2.60	2.60	3.75
Barbed wire, galv., P'gh....	3.55	3.55	3.55	4.45
Tin plate, 100-lb. box, P'gh....	\$5.00	\$5.25	\$5.25	\$8.50

Old Material, Per Gross Ton:	Oct. 18, 1921	Oct. 11, 1921	Sept. 20, 1921	Oct. 19, 1920
Carwheels, Chicago....	\$17.00	\$16.50	\$14.50	\$36.00
Carwheels, Philadelphia....	17.00	17.00	17.00	40.00
Heavy steel scrap, P'gh....	14.00	14.00	14.00	28.00
Heavy steel scrap, Phila....	\$12.50	12.00	11.50	23.00
Heavy steel scrap, Ch'go....	13.00	12.50	11.50	20.50
No. 1 cast, Pittsburgh....	17.50	17.50	17.00	40.00
No. 1 cast, Philadelphia....	17.00	17.00	17.00	39.00
No. 1 cast, Ch'go (net ton)....	14.50	13.50	13.25	28.00
No. 1 RR. wrot, Phila....	16.00	16.00	15.00	28.00
No. 1 RR. wrot, Ch'go (net)....	13.50	13.00	11.50	20.00

Coke, Connellsville, Per Net Ton at Oven:	Oct. 18, 1921	Oct. 11, 1921	Sept. 20, 1921	Oct. 19, 1920
Furnace coke, prompt....	\$3.25	\$3.35	\$3.25	\$15.50
Foundry coke, prompt....	4.50	4.50	4.25	16.50

Metals,	Cents	Cents	Cents	Cents
Per Lb. to Large Buyers:				
Lake copper, New York....	13.00	13.12½	12.25	16.00
Electrolytic copper, N. Y....	12.75	12.82½	12.12½	16.00
Zinc, St. Louis....	4.67½	4.60	4.17½	7.25
Zinc, New York....	5.17½	5.10	4.67½	7.50
Lead, St. Louis....	4.50	4.50	4.45	7.00
Lead, New York....	4.70	4.70	4.65	7.25
Tin, New York....	28.00	27.00	26.50	38.25
Antimony (Asiatic), N. Y....	5.00	5.00	4.45	6.50

Composite Price, Oct. 18, 1921, Finished Steel, 2.221c. Per Lb.

Based on prices of steel bars, beams, tank plates, plain wire, open-hearth rails, black pipe and black sheets	Oct. 11, 1921, 2.236c.
These products constitute 88 per cent of the United States output of finished steel.	Sept. 20, 1921, 2.200c.
	Oct. 19, 1920, 3.781c.
	10-year pre-war average, 1.684c.

Composite Price, Oct. 18, 1921, Pig Iron, \$20.03 Per Gross Ton

Based on average of basic and foundry irons, the basic being Valley quotation, the foundry an average of Chicago, Philadelphia and Birmingham	Oct. 11, 1921, \$19.93
	Sept. 20, 1921, 20.01
	Oct. 19, 1920, 44.26
	10-year pre-war average, 15.72

than they have been before since early in the year. Possibly there has been a slight decrease in finishing mill activities, but this is more than counterbalanced by larger blast furnace and steel works operations. As noted elsewhere, 42 of 140 blast furnaces in this and nearby districts now are making iron, this being a numerical rate of exactly 30 per cent and a gain of about 11 per cent from the low point of the summer. Steel plant operations in the Wheeling district still are low, but in Pittsburgh they average about 40 per cent. That is also the gait at Johnstown, Pa., and equally as good a showing is noted in the Mahoning and Shenango valleys. The Carnegie Steel Co. has put on an additional blast furnace at its Ohio works at Youngstown, Ohio, giving it three active of six at that point, while the Jones & Laughlin Steel Co. has turned on the blast in two furnaces since Oct. 1. The general showing is fairly satisfactory and the only question now is as to whether the present rate can be maintained, in view of the fact that new orders are not coming in as fast as old ones are being completed.

Prices still show much irregularity. The past week has brought advances of \$5 a ton in the quotations of a number of independent makers of sheets, and manufacturers of hot-rolled strips, hoops and bands, who hitherto have been taking business in these products as low as 2c., base, last Saturday advanced to 2.25c., base, but as is the common practice in such advances, customers were allowed to enter probable needs over a

fairly long period at the old base. On the other hand, steel bars definitely seem to have settled to 1.50c., base, on such important tonnages as have been offered, as against a nominal asking quotation of 1.65c., while the tin plate market is weakening and the intimation is more frequent that adherence to the Sept. 12 wire products schedule is not especially rigid. Price cutting in line pipe is extremely sharp.

Little is being done in pig iron because consumers think producers should pass along the more or less fictitious benefit to be derived from the lower ore freight rates. The coke market has grown softer and dealers in scrap still are finding it difficult to interest consumers at the prices they ask.

Pig Iron.—It has been the experience of a number of furnace interests here that since the announcement of the reduction in ore freight rates, buyers have lost interest in the market. The Westinghouse Electric & Mfg. Co. is reported to have closed with a western Pennsylvania furnace for about 1300 tons of foundry iron on a basis of \$20.50 for No. 3, \$21 for No. 2, and \$22 for No. 1. The delivered prices on this iron were about 50c. per ton below what they would have been if the iron had come from the Valley. The Standard Engineering Works, Ellwood City, Pa., is reported to have bought 300 tons of No. 1 iron at \$22, Valley furnace. A sale is noted of 500 tons of gray forge to a Pittsburgh district melter at \$20, Valley furnace basis, the iron to be shipped from a Cleveland district furnace.

The American Steel Foundries is in the market for 350 tons of standard Bessemer, and the Duquesne Steel Foundry Co. wants 250 tons of the same grade. Some effort is being made to put up the price of Bessemer, but to date \$20, Valley furnace, is as high as it has been possible to make sales. Interest in basic iron is low, although the American Rolling Mill Co., Middletown, Ohio, has put out an inquiry for 2000 tons. The inquiry, however, specifies iron with silicon not under 0.90 nor above 1.10 in silicon, a rather difficult analysis for any furnace except one running on that grade.

We quote Valley furnace, the freight rate for delivery to the Cleveland or Pittsburgh district being \$1.96 per gross ton:

Basic	\$19.25 to \$20.00
Bessemer	20.00
Gray forge	20.00
No. 2 foundry	21.00
No. 3 foundry	21.00
Malleable	20.50

Ferroalloys.—Some demand still exists for 50 per cent ferrosilicon, but interest in other ferroalloys is extremely limited and sales of the former usually are single carloads. Prices still lean in buyers' favor. English makers of ferromanganese evidently are meeting the quotations recently made on German material, a Youngstown steel company reporting that it has been offered English material at \$60 delivered. The quotation of American makers of \$65 delivered has been shaded, a price of \$64.35 delivered, Youngstown, having recently been made. Most makers of 50 per cent ferrosilicon are endeavoring to hold the market at \$60 furnace, freight allowed, but such business as has been done recently in this district has been at \$57. An Eastern maker of spiegeleisen now is quoting \$26 furnace for 19 to 21 per cent material and \$25 for that of 16 to 19 per cent manganese content. The latter grade is offered at \$24 to \$25 by a furnace in western Pennsylvania having a freight rate into Pittsburgh of \$1.96. The last business reported in this material was 200 tons of 20 per cent at \$30 delivered Youngstown.

We quote 78 to 82 per cent domestic ferromanganese at \$60 to \$65 delivered; 78 to 82 per cent foreign ferromanganese, \$53.28 to \$55, c.i.f. Atlantic seaboard. We quote average 20 per cent spiegeleisen at \$30 to \$32, delivered, Pittsburgh or Valleys; 50 per cent ferrosilicon, domestic, \$57 to \$60, freight allowed. Bessemer ferrosilicon is quoted f.o.b. Jackson and New Straitsville, Ohio, furnaces as follows: 10 per cent, \$38.50; 11 per cent, \$41.80; 12 per cent, \$45.10; 13 per cent, \$49.10; 14 per cent, \$54.10; silvery iron, 6 per cent, \$27; 7 per cent, \$28; 8 per cent, \$29.50; 9 per cent, \$31.50; 10 per cent, \$33.50; 11 per cent, \$36; 12 per cent, \$38.50. The present freight rate from Jackson and New Straitsville, Ohio, into the Pittsburgh district is \$4.06 per gross ton.

Billets, Sheet Bars and Slabs.—Activity still is lacking and nothing more than an appraisal of prices is possible. Accompanying the recent advance of \$5 in black and galvanized sheets, some of the Youngstown integrated companies advanced sheet bars to \$34. This price has not yet found any basis in sales; indeed, only moderate tonnages have been booked at the former quotation of \$32. Not enough demand is coming out for billets and slabs to provide a real line on prices.

We quote 4 x 4 in. soft Bessemer and open-hearth billets at \$29 to \$30; 2 x 2-in. billets, \$30 to \$32; Bessemer and open-hearth sheet bars, \$30 to \$32; slabs, \$30 to \$31; forging billets, ordinary carbons, \$35, all f.o.b. Youngstown or Pittsburgh mills.

Wire Rods.—Makers still are asking \$41 for base size of soft rods, but they are not getting it. As a matter of fact, \$40 represents the maximum as far as sales are concerned and it is reported that less has been done in special cases and under special conditions. Prices are given on page 1044.

Structural Material.—Awards have increased again and include one of 1300 tons, but the complaint still is that competition for work is severe, and very low prices prevail. It is reported that in one of the largest awards a price of \$57 per ton, erected, was made. The Jones & Laughlin Steel Co. has taken 150 tons for a cleaning building for the Standard Sanitary Mfg. Co., New Brighton, Pa., while the Memphis Steel Construction Co. has taken 100 tons for a factory building for the Seyler Mfg. Co., Etna, Pa. The McClintic-Marshall Co. has taken 1312 tons for a new building for the Standard Underground Cable Co., Pittsburgh; 650 tons for roof supports for the Liberty tunnels, Pittsburgh; 300 tons for an extension to the skelp mill of the Central Tube Co., Economy, Pa.; 125 tons for a new building for the Air Reduction Co., Pittsburgh, and 100 tons of duck plate girder spans for the Chicago, Burlington

& Quincy Railroad. Bids are being taken by the Wheeling Steel Corporation for the building to house its new rod and wire plant at its Portsmouth, Ohio, works. This project involves about 2500 tons, and an award is expected shortly. The market in plain material is only moderately active, and competition for passing orders keeps prices in buyers' favor. The general asking price on structural beams is 1.65c., base, but protection has been given on sizable projects down to 1.50c. by some makers. Prices are given on page 1044.

Plates.—Real activity still is absent, but order books of some makers are larger as a result of an accumulation of a moderate-sized booking. There is not enough real buying to give prices much stability, and mills holding to 1.65c. are steadily losing orders to others anxious for business and willing to go lower to get it. On attractive orders the market is quoted from 1.50c. to 1.55c. and on small tonnages from 1.60c. to 1.65c. Prices are given on page 1044.

We quote sheared plates, 1/4 in. and heavier, tank quality, at 1.50c. to 1.65c. f.o.b. Pittsburgh.

Wire Products.—Very little new business is developing and the prices established as of Sept. 12 are finding little, if any, basis in sales, and indeed are being shaded. Jobbers are thoroughly protected against their requirements by contracts until Nov. 15, and are specifying fairly well against them. If anything, the market is quieter both as regards specifications and orders, as buyers generally are expecting lower freight rates to develop out of the railroad dispute and want to be in a position to benefit by any such change. Agricultural demands still are limited, but as manufacturers quite generally are guaranteeing prices against a decline through to the spring, it is confidently expected there will be a substantial increase in the demand from this source later in the year. Typical of the lack of agricultural demand is the present operating rate of one large company, which shows full engagement of nail machines, but only about 20 per cent operation of barbed wire capacity.

We quote wire nails at \$2.90 base per keg, Pittsburgh, and bright basic and Bessemer wire at \$2.60 base per 100 lb., Pittsburgh.

Steel Rails.—Regular makers of light rails report no special difficulty in doing business at 1.75c. base for 25 to 45-lb. sections, but this is not the experience of those makers who roll these rails only at intervals and consequently are not rated as regular producers. The latter are said to have gone as low as 1.70c. and even 1.65c. to secure orders. Re-rolled light rails are held at about 1.60c. base. General demand still is moderate.

We quote 25 to 45-lb. sections, rolled from new steel, 1.70c. to 1.75c. base; rolled from old rails, 1.60c. base; standard rails, \$45 per gross ton mill for Bessemer and \$47 for open-hearth sections.

Spikes and Track Bolts.—Demand is purely hand-to-mouth and since there is not enough business to give all makers a share, prices favor buyers. The largest inquiry in spikes before makers is that of 5000 kegs for the Big Four Railroad, bids against which were opened in Cincinnati late last week. The award has not yet been made public, but it is believed that it will be placed at around \$2.30 base, Pittsburgh. Quotations on track bolts are being shaded on attractive business. Prices are given on page 1044.

Hot-Rolled and Cold-Rolled Strips.—Effective Oct. 15, several makers of hot-rolled strips who had been taking business at 2c. base advanced the quotation to 2.25c. base, and this now is the quotation of all makers. The advance has served to strengthen the position of those who had adhered to a base of 2.25c. Customers of the mills which advanced the price were allowed to cover against their requirements for a period at the old quotation. Cold-rolled strips are at 3.75c. base for large tonnages and 4c. for small lots. A fair proportion of recent bookings has been at the higher figure.

Iron and Steel Bars.—There is a quantity price spread on soft steel bars, with 1.50c. the base on large tonnages and 1.60c. to 1.65c. on small lots. Reinforcing bars, rolled from new steel, are quotable at the same range, with quantity and attractiveness of the business governing the price. Not much inquiry is originating in this immediate territory, but there is before makers a good-sized tonnage for the Jamaica Parkway, Ja-

maica, L. I. The 740 tons of bars for the Coney Island boardwalk has been placed with a Buffalo maker at a price somewhat below 1.40c., Pittsburgh. Iron bars are doing better, but the improvement is in the number rather than the size of the orders.

We quote steel bars rolled from billets at 1.50c. to 1.65c.; reinforcing bars, rolled from billets, 1.50c. to 1.65c. base; reinforcing bars, rolled from old rails, 1.50c.; refined iron bars, 2.15c. to 2.25c. in carloads, f.o.b. mill, Pittsburgh.

Iron and Steel Pipe.—Activity still is lacking in oil country pipe, but there is a steady gradual increase in orders for standard pipe. Few makers, however, have any considerable amount of forward business on their books and since there is no doubt as to deliveries, the current demand is not marked by much urgency. Competition for orders for line pipe is extremely sharp and it is reported that less than \$45 per ton Pittsburgh, recently was done on 4-in. pipe. There is fairly good observance of the last card in other respects. It is reported that the Magnolia Petroleum Co. and the Humble Oil Co. are negotiating for a joint pipe line of 125 miles involving about 7000 tons. Discounts are given on page 1044.

Steel Skelp.—Demand at best is limited and actual sales are few and small. The quotable market remains at 1.60c. to 1.65c. for pipe skelp. Competition for business is sharp.

Sheets.—A recent advance of \$5 per ton in black and galvanized sheets, announced by some of the independents, still lacks the support of the American Sheet & Tin Plate Co., which is holding at 3c., 4c. and 2.50c., base respectively, for black, galvanized and blue annealed. A fair amount of business has been taken at these prices by all makers, but it is safe to say that the average prices of current shipments are nearer 2.75c. for black, 3.75c. for galvanized and 2.25c. for blue annealed. The latter grade still can be bought at 2.25c., base, even from some of the makers now quoting 4.25c. for galvanized and 3.25c. for black sheets. Light plates or heavy-gage blue-annealed sheets recently were included in some plate business taken at 1.70c., base. Sheet mill operations generally are a little lighter this week than they were recently. Prices are given on page 1044.

Tin Plate.—Interest in the market on the part of consumers still is pronounced for this time of the year, but apparently there is not enough business to go around, as production plate has been taken recently by some makers as low as \$5 per base box, Pittsburgh. Some makers still are holding to \$5.25 per base box, but are meeting competition. Stock tin plate is not plentiful and is quotable at \$4.50 to \$4.75 per base box. Some can makers are inquiring for first quarter and first half tonnages, but as makers have not yet decided upon prices, no business of this sort yet has been entered.

Hoops and Bands.—Effective Oct. 15, the Sharon Steel Hoop Co. announced an advance of \$5 per ton, to a base of 2.25c., on these products. Other makers who had been quoting less than 2.25c. have restored that price. Business remains light although it is better now than it was a short time ago. Very little demand is developing from cooperage interests which, as a result of prohibition, now are dependent to a large degree upon oil and turpentine industries for business. The oil industry rapidly is moving away from the use of wooden barrels to all steel containers, particularly for export business.

Cotton Ties.—The season has practically ended, as the cotton crop is a small one and rollings and shipments were completed more promptly than usual. The October price was 1.33c. per bundle of 45-lb.

Boiler Tubes.—The market is still extremely quiet in both steel and iron tubes and buyers are not having much trouble either in covering their requirements or in getting some concessions from quoted discounts. Discounts are given on page 1044.

Cold Finished Steel Bars and Shafting.—These products, notably in the smaller sizes, still are laggard in feeling such improvement as has developed in steel products generally. The explanation, as far as screw stock is concerned, is found in the fact that some of the larger automotive units have surplus supplies which they have written down to well below current mill prices, and manufacturers in trying to secure orders

not infrequently are obliged to compete with these resale tonnages. Makers quite generally are endeavoring to maintain a base of 2.25c. Pittsburgh, on the ground that soft steel bars of the analysis suitable for cold finishing are not obtainable at much less than 1.60c. base, Pittsburgh, while on some recent purchases as high as 1.65c. Pittsburgh, was paid. Business, however, has been lost in cold finished bars at 2.25c., and it is evident that some makers are meeting the resale competitive prices. Ground shafting holds at 2.75c., base, mill for carloads.

Nuts, Bolts and Rivets.—Makers in this district have experienced no material improvement in business. Possibly, competition for orders for bolts and nuts is not quite as keen as it was recently and prices of these products are more stable. Prices of rivets, however, are being shaded by as much as \$3 per ton. Prices and discounts are given on page 1044.

Coke and Coal.—Offerings of furnace coke are ample for current needs and the market has lost much of its recent firmness. While some sales of spot coke have been made at \$3.35 per net ton oven, sales also have been at \$3.25, and more coke is available at that price. The spot market, therefore, is quotable from \$3.25 to \$3.35. A few contracts for the remainder of the year involving moderate tonnages have been closed at \$3.35. Producers generally are asking \$3.50 against such business, but usually yield 10c. or 15c. per ton rather than lose an order. Foundry coke is in good demand, with some extra requirements being sought on account of the possibility of a railroad tieup. Since production of this grade is moderate, prices are firm at \$4.50 to \$4.75 per net ton oven, for standard grade. Demand for coal is disappearing and prices, notably on slack, are inclined lower. Steam slack recently has sold as low as \$1 at mines for No. 8 Ohio coal, while as low as \$1.50 has been done on gas slack. Mine run steam coal is quotable from \$1.65 to \$1.75, by-product from \$1.90 to \$2.15, and gas from \$2.25 to \$2.65.

Old Material.—The possibility of a railroad tieup is not changing the attitude of melters with regard to purchases, because it is quite generally realized that if the steel companies and foundries cannot get finished materials out, there will not be much reason for uneasiness about getting raw materials in. Recent prices are well maintained on all grades of old material, but dealers are having a hard time to get consumers to pay what they ask. The situation has simmered down to a campaign of attrition and the immediate course of prices hinges on whether melters or dealers will weaken first. Floating supplies are moderate and the large dealers, who hold most of the supply, appear financially able to hold. On the other hand, consumers feel that prices are too high and are buying sparingly. If such a buying policy is sustained, it cannot fail to develop weak spots among dealers, but if purchases become necessary, it is hard to see how higher prices can be prevented. Small tonnages which must be moved can be bought at quotations, but dealers will not go short of the market at these prices.

We quote for delivery to consumers' mills in the Pittsburgh and other districts taking the Pittsburgh freight rate, as follows:

Heavy melting steel, Steubenville, Follansbee, Brackenridge, Monessen, Midland and Pittsburgh.....	\$14.00 to \$14.50
No. 1 cast cupola size.....	17.50 to 18.00
Rerolling rails, Newark and Cambridge, Ohio; Cumberland, Md.; Huntington, W. Va., and Franklin, Pa.	16.00 to 17.00
Compressed sheet steel.....	12.00 to 12.50
Bundled sheet sides and ends, f.o.b. consumers' mills, Pittsburgh dist....	10.50 to 11.00
Railroad knuckles and couplers.....	15.00 to 15.25
Railroad coil and leaf springs.....	15.00 to 15.25
Low phosphorus melting stock, bloom and billet ends, heavy plates, ¼-in. and thicker	17.50 to 18.00
Railroad malleable	13.00 to 13.50
Iron car axles.....	22.00 to 23.00
Locomotive axles, steel.....	21.00 to 22.00
Steel car axles.....	15.50 to 16.00
Cast iron wheels.....	16.00 to 16.50
Rolled steel wheels.....	15.00 to 15.50
Machine shop turnings.....	9.75 to 10.25
Sheet bar crop ends at origin.....	12.50 to 14.00
Heavy steel axle turnings.....	12.00 to 12.50
Short shoveling turnings.....	11.00 to 11.50
Heavy breakable cast.....	15.50 to 16.00
Stove plate	13.00 to 13.50
Cast iron borings.....	10.50 to 11.00
No. 1 railroad wrought.....	13.00 to 13.50

Chicago

CHICAGO, Oct. 18.

The threatened railroad strike has neither hastened purchases for prompt shipment nor discouraged the placing of orders for less immediate delivery. So far as can be ascertained, it has had no perceptible effect on the market. Bookings of mills and furnaces are about the same rate as in recent weeks, possibly slightly smaller in a number of commodities. Improvement in the operation of some producers is balanced by contraction in the output of others. The Illinois Steel Co. continues to blow 10 of its blast furnaces, but has increased its ingot production 5 per cent, its present output being on a 44 per cent basis. The Inland Steel Co.'s operations, on the other hand, have declined to 35 per cent of normal. Merchant pig iron production is unchanged.

The scrap market is notable as the one department of the industry in which a rather pronounced bullish sentiment prevails. Although buying is still largely in the hands of the dealers, one rather substantial purchase by a consumer has been made at advanced levels. On the other hand, a persistent report that the leading steel interest has bought a large tonnage of open-hearth grades is emphatically denied by both of the supposed parties to the transaction. For some months past scrap dealers have been stocking their yards at steadily advancing prices and it is believed that the time is close at hand when it will become apparent whether or not their judgment was well founded. Operations of users have certainly not increased in such a degree as to forecast heavy scrap buying in the immediate future. On the other hand, there are those who believe that the end of the present depression is in sight and that an early reduction in freight rates would remove the last obstacle to a resumption of industrial activity on a normal scale. The uninterrupted increase in freight car loadings even under present rates is cited in support of the view that lower transportation costs alone are required to usher in a period of rapid industrial recovery.

Pig Iron.—There continues to be some small sales of foundry and malleable at \$22, base, local furnace, but the predominant price at which material is moving is \$21. Brokers still have some tonnage which they are offering at this price and in a number of cases a producer has met this competition. The threat of a railroad strike has had no noticeable effect on the market. No requests for the hastening of shipments and no orders calling for rush delivery have been received. The market is still rather quiet, but inquiry is somewhat more active. The Link-Belt Co. wants 300 to 500 tons of malleable for delivery over the rest of the month at its Indianapolis plant. A freight car manufacturer is in the market for 500 tons of malleable and the St. Paul Railroad for 800 tons of the same grade. The American Rolling Mill Co. is asking for prices on 2000 tons of basic and an inquiry for 300 tons of charcoal is current. Carload sales of charcoal have been made at both \$28 and \$30, base furnace, and an order for 200 tons was recently placed at the latter price. An idle charcoal furnace is expected to blow in soon. A Milwaukee melter has sent out an inquiry for 1500 tons of Southern foundry for first quarter delivery. Few sales of Southern iron are reported in this territory, the heavy freight disadvantage being an effective barrier to such business. For the purpose of securing an adjustment in rates from Birmingham which will permit the Southern product to enter this section, Southern furnace representatives last week conferred with railroad officials in this city. Even now sales of Southern iron are occasionally made because special material is wanted. Thus a sale of 100 tons of high phosphorous foundry, 3.25 to 3.75 per cent silicon, was made by a local office to a Canadian foundry at \$19, base Birmingham, plus the Redfield differentials, which brought the price up to \$25, Birmingham. Notwithstanding the fact that Southern producers are getting little business in this vicinity, reports indicate that their bookings are steadily mounting and that five idle furnaces are about to blow in. It is intimated that much of their tonnage is from cast-iron pipe foundries. A sale of a carload

of low phosphorous was recently made at \$40.02, delivered Chicago, or \$34, furnace. Tennessee 8 per cent silvery has been sold at \$30.54, delivered Chicago.

Quotations on Northern foundry, high phosphorous malleable and basic irons are f.o.b. local furnace and do not include a switching charge averaging 70c. per ton. Other prices are for iron delivered at consumers' yards, or when so indicated, f.o.b. furnace other than local.

Lake Superior charcoal, averaging sil.	
1.50, delivered at Chicago.....	\$31.50 to \$33.50
Northern coke, No. 1, sil. 2.25 to 2.75.	21.50 to 22.50
Northern coke, foundry, No. 2, sil.	
1.75 to 2.25.....	21.00 to 22.00
Northern high phos.....	22.00
Southern foundry, sil. 1.75 to 2.25.....	25.67
Malleable, not over 2.25 sil.....	21.00 to 22.00
Basic	22.00
Low phos., Eastern furnace, sil. 1 to 2	
per cent copper free.....	34.00
Silvery, sil. 8 per cent.....	30.54 to 34.82

Ferroalloys.—Ferromanganese has been sold locally at as low as \$53, seaboard, or \$61.60, delivered. There is little activity in spiegeleisen because ferromanganese is relatively much cheaper. In the St. Louis district the Scullin Steel Co. is reported to have bought a carload of 50 per cent ferrosilicon at \$62, freight allowed.

We quote 78 to 82 per cent ferromanganese, \$61.60, delivered; 50 per cent ferrosilicon, \$60, delivered; spiegeleisen, 18 to 22 per cent, \$36 to \$37, delivered.

Railroad Equipment.—The Chicago, Rock Island & Pacific has bought 14 mikado type locomotives from the American Locomotive Co. The Mississippi Central and a subsidiary have each bought a locomotive from the same builder.

Cast-Iron Pipe.—Prices are steady and business is still developing. Detroit is contemplating the purchase of 9000 tons of 6- to 24-in. and 8000 tons of 30- to 48-in., but has not yet advertised. For a subdivision at Dearborn, Mich., private parties are negotiating for 500 tons of 6-in. Recent lettings include: Kenmore, Ohio, 500 tons to United States Cast Iron Pipe & Foundry Co.; Highland Park, Mich., 150 tons, to American Cast Iron Pipe Co.; Bay City, Mich., 200 tons, to National Cast Iron Pipe Co. Pending business includes: Lima, Ohio, 100 tons, bids in Oct. 21; West Allis, Wis., 726 tons of 24-in., Oct. 22, to be sublet by contractor; Edgerton, Wis., 85 tons of 10-in., Oct. 15; Wauwatosa, Wis., 75 tons; Sturgis, Mich., 85 tons, bids taken, Oct. 12.

We quote per net ton, f.o.b. Chicago, ex-war tax, as follows: Water pipe, 4-in., \$45.60 to \$47.10; 6-in. and above, \$42.60 to \$44.10; class A and gas pipe, \$3 extra.

Rails and Track Supplies.—A Southwestern road which had held up shipments for nine months has released 20,000 tons of rails and necessary fastenings. Other releases against contracts include 8000 tons and 18,000 tons of rails and complementary fastenings respectively from the two Western lines terminating in Chicago. Specifications for tie plates, angle bars, track bolts and spikes are coming in in encouraging tonnages, and some new business in spikes and bolts is being placed, usually in 500 or 1000 keg lots. Competition for this business is keen and some concessions are being made, particularly on spikes.

Standard Bessemer rails, \$45; open-hearth rails, \$47; light rails rolled from new steel, 1.70c. to 1.75c. f.o.b. makers' mills.

Standard railroad spikes, 2.40c., Pittsburgh; track bolts with square nuts, 3.40c., Pittsburgh; tie plates, steel and iron, 2c., f.o.b. makers' mills.

Plates.—It is too early to ascertain the effect of threatening transportation difficulties on steel bookings. Although it is no secret that railroad executives would welcome a strike as an opportunity to settle their differences with organized labor once and for all, there are few who believe that the unions will actually carry out their announced program. The railroads themselves have not postponed action on contemplated purchases. The Chicago, Burlington & Quincy takes bids on 1500 tons of plates today. As will be noted in the rails and track supplies paragraph, a Southwestern line which had held up shipments against a rail contract for nine months released 20,000 tons yesterday. The situation in the plate market is substantially unchanged. Orders and specifications are a little more liberal every week, but there is not yet enough tonnage to keep the mills busy. So far as the general run of business is concerned, sellers are maintaining a firmer attitude on prices, realizing the futility of

competition which brings in orders at heavy losses. At the same time, the exceptional buyer who enters the market for a large tonnage of desirable specifications can still place his business at concessions under the prices quoted below. This is, of course, to be expected at a time when such a tonnage may tide a mill over until a backlog of smaller orders has been accumulated. Among recent orders taken by local mills is one for 1700 tons from a Milwaukee purchaser and one for 1000 tons from an Illinois boiler manufacturer.

The ruling mill quotations range from 1.75c. to 1.85c. Chicago. Jobbers quote 2.88c. for plates out of stock.

Bars.—Demand for mild steel bars is still subnormal, and while sellers are less disposed to sharp price cutting such as prevailed some weeks ago, attractive inquiries are still bringing out concessions. No reinforcing jobs of size have been let recently, but several are being figured on. The Katzinger Building, Chicago, will require 2500 tons. Between 250 and 300 tons for the Illinois Merchants' Bank Building, Chicago, are expected to be placed this week. At Grand Rapids, Mich., a filtration plant will require 350 tons and a bridge 300 tons. Local bar iron mills continue to adhere to a base of 1.75c., Chicago, but without booking much business. Orders for rail carbon steel bars have been sufficient to keep mills running single turn an average of three weeks out of four. The ruling price on hard steel remains at 1.75c., Chicago, with some concessions reported. Warehouse prices on deformed steel bars are weak and do not exceed 2.10c., base. Jobbers have reduced cold-rolled steel bars and shafting 35c. per 100 lb. for rounds and 15c. for flats, squares and hexagons.

Mill prices are: Mild steel bars, 1.75c. to 1.85c. Chicago; common bar iron, 1.75c., Chicago; rail carbon, 1.75c., mill or Chicago.

Jobbers quote 2.78c. for steel bars out of warehouse. The warehouse quotation on cold-rolled steel bars and shafting is 3.85c. for rounds and 4.35c. for flats, squares and hexagons. Jobbers quote hard and medium deformed steel bars at 2.10c. base.

Sheets.—The advance of \$5 a ton announced by a number of mills as effective Oct. 15 has not been followed by the local independent. Demand is still fairly active, but in the opinion of some observers not sufficiently strong to warrant another advance so soon. The move is regarded as an attempt to drive in business at the former quotations. The local warehouses have advanced iron sheets \$5 a ton, the new quotations being 4.39c. for No. 10 blue annealed and 6.54c. for No. 28 galvanized. Jobbers have not altered their steel sheet prices.

Mill quotations are 3c. for No. 28 black, 2.25c. to 2.50c. for No. 10 blue annealed and 4c. for No. 28 galvanized, all being Pittsburgh prices, subject to a freight to Chicago of 38c. per 100 lb.

Jobbers quote: Chicago delivery out of stocks, No. 10 blue annealed, 3.38c.; No. 28 black, 4.15c.; No. 28 galvanized, 5.15c. Hoops and bands, 3.48c.

Bolts and Nuts.—Operations of automobile makers are falling off with a corresponding effect on bolt and nut purchases. The principal current demand is from jobbers and railroads. The Louisville & Nashville is inquiring for 1500 kegs of hot-pressed nuts. Most makers are trying to maintain the discounts recently announced, but some concessions are still reported, particularly on attractive inquiries. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1037.

Jobbers quote structural rivets, 3.68c.; boiler rivets, 3.78c.; machine bolts up to $\frac{3}{4}$ x 4 in., 60 per cent off; larger sizes, 55 off; carriage bolts up to $\frac{3}{4}$ x 6 in., 55 off; larger sizes, 50 and 5 off; hot pressed nuts, square and hexagon tapped, \$3 off; blank nuts, \$3.25 off; coach or lag screws, gimlet points, square heads, 60 per cent off. Quantity extras are unchanged.

Wire Products.—Jobbers continue to buy freely for prompt shipment, but are not piling stocks. The threatened railroad strike has had the effect of bringing in a number of requests to hurry up deliveries. Fair orders continue to come from the railroads, but business from manufacturing users is still unsatisfactory. Operations of the leading producer are estimated well over 60 per cent. For mill prices, see finished iron and steel, f.o.b. Pittsburgh, page 1037.

We quote warehouse prices f.o.b. Chicago: No. 9 and heavier black annealed wire \$3.48 per 100 lb.; No. 9 and heavier bright basic wire, \$3.63 per 100 lb.; common wire nails, \$3.63 per 100 lb.; cement coated nails, \$3.05 per keg.

Structural Material.—There continues to be a fair amount of fabricating work on the books and in prospect. One representative Western fabricator reports that he is figuring on eight jobs involving 8000 tons. On the other hand, the mills report that the demand for plain material has fallen off, but it is possible that this is merely a temporary dip in buying and has no real significance. If anything, prices of plain material are firmer, although attractive tonnages are still bringing out some concessions by the mills. Fabricating awards include:

Wisconsin Steel Works, trestle, South Chicago, 363 tons, to American Bridge Co.

Masonic Temple, Blue Island, Ill., 109 tons, to Duffin Iron Works.

Great Northern Railway, draw bridge, Delta, Wash., 485 tons, to Milwaukee Bridge Co. instead of Wisconsin Bridge & Iron Co. as reported last week.

Chicago & Alton Railroad, approaches to freight house, Chicago, 201 tons, to American Bridge Co.

Gallup-American Mining Co., power house and breeching, Gallup, N. M., 300 tons, to Worden-Allen Co.

American Car & Foundry Co., blacksmith shop, Terre Haute, Ind., 365 tons, to American Bridge Co.

Chicago, Burlington & Quincy Railroad, three 55-ft. deck plate girder spans, 100 tons, to McClintic-Marshall Co.

Pending business includes:

Filtration plant, Detroit, 2500 tons.

Blum Building addition, Chicago, 600 tons, bids to be in to-day.

Catholic Club, Memphis, Tenn., 660 tons.

The mill quotation on plain material ranges from 1.75c. to 1.85c., Chicago. Jobbers quote 2.88c. for materials out of warehouse.

Old Material.—Notwithstanding the fact that an important iron and steel mill has shut off all shipments, dealers continue to bid up prices in buying railroad material, thereby evincing their confidence in a market for their purchases later on. While the market is still largely in the hands of sellers, some consumptive buying has developed, notably 1500 tons of No. 1 wrought which brought \$13.50 delivered and a round tonnage of No. 1 busheling which sold at \$10.50 per net ton delivered. There are unconfirmed reports of a substantial sale of open-hearth grades to a local steel mill, which seem to be substantiated by heavy coverings by sellers. One dealer paid a railroad \$13.16 per gross ton tracks for 100 tons of heavy melting. This is equivalent to \$13.86 delivered if the destination was in the Chicago, switching district. Railroad offerings include: The Illinois Central, 4000 tons; the Rock Island, 3700 tons; and the Soo Line 20 lists of 1000 tons and 220 tons each.

We quote delivery in consumers' yards Chicago and vicinity, all freight and transfer charges paid, as follows:

Per Gross Ton

Iron rails	\$17.00 to \$17.50
Relaying rails	27.50 to 30.00
Car wheels	17.00 to 17.50
Steel rails, rerolling	14.00 to 14.50
Steel rails, less than 3 ft.	14.00 to 14.50
Heavy melting steel	13.00 to 13.50
Frogs, switches and guards cut apart	13.00 to 13.50
Shoveling steel	12.50 to 13.00
Low phos., heavy melting steel ..	15.50 to 16.00
Drop forge flashings	8.00 to 8.50
Hydraulic compressed sheet	8.50 to 9.00
Axle turnings	9.00 to 9.50

Per Net Ton

Iron angles and splice bars	15.00 to 15.50
Steel angle bars	12.00 to 12.50
Iron arch bars and transoms	15.50 to 16.00
Iron car axles	20.00 to 20.50
Steel car axles	14.50 to 15.00
No. 1 busheling	10.50 to 11.00
No. 2 busheling	7.25 to 7.75
Cut forge	11.75 to 12.25
Pipes and flues	8.50 to 9.00
No. 1 railroad wrought	13.50 to 14.00
No. 2 railroad wrought	12.00 to 12.50
Steel knuckles and couplers	13.50 to 14.00
Coil springs	14.50 to 15.00
No. 1 machinery cast	14.50 to 15.00
No. 1 railroad cast	14.00 to 14.50
Low. phos. punchings	12.50 to 13.00
Locomotive tires, smooth	11.50 to 12.00
Machine shop turnings	4.00 to 4.50
Cast borings	6.00 to 6.50
Stove plate	12.75 to 13.25
Grate bars	11.50 to 12.00
Brake shoes	11.50 to 12.00
Railroad malleable	13.75 to 14.25
Agricultural malleable	13.75 to 14.25
Country mixed	9.00 to 9.50

Cleveland

CLEVELAND, Oct. 18.

The threatened nation-wide strike of the railroads is causing some anxiety among consumers of steel who fear they will run short of needed material and has brought many requests to the mills that shipments on existing orders be rushed. The crowding of mills for delivery seems more in evidence in respect to sheets than to other forms of finished material. Stocks of most consumers are low and should there be a prolonged strike, many plants would be in danger of running short of material. The requests to hurry shipments are coming from the most part from plants that are fairly busy making standard lines of products and which wish to avoid a curtailment of operations. However, the danger of a strike has brought out virtually no new orders, as consumers have under contract enough steel to care for their early needs. The situation is far less serious than it would be were manufacturing plants running near normal capacity and with their own customers crowding them for delivery. Mills are endeavoring to comply with the requests to hurry shipments and some of the sheet mill plants may find it necessary to place more mills in operation in order to make delivery and before the date set for the strike. Foundries as a rule do not appear to be greatly disturbed by the threatened strike. A few consumers have wired in requests to furnaces that pig iron shipments be rushed, but in only one or two cases have foundries rushed into the market and made purchases in order to get iron into their yards before the scheduled date of the strike. While stocks in foundry yards are generally low, as a result of the policy of buying from hand to mouth, the possibility of lower freight rates is evidently causing some consumers to withhold shipping orders. In case railroad shipments of pig iron are cut off, many foundries will use trucks to haul pig iron from nearby furnaces and for delivering castings to their customers. Some of the Cleveland foundries now operated at very limited capacity will shut down in case of a strike. Many foundries have been stocking up on coke recently and will not be inconvenienced by the cutting off of the coke supply. As the ore shipping season will be virtually over Nov. 1, with traffic conditions normal there would be little ore moved to the interior furnaces during November.

Iron Ore.—The 28 per cent reduction in freight rates from Lake Erie ports to interior furnaces was placed in effect to-day, Tuesday, by most of the railroads and will become effective Thursday on the remaining ore carrying roads. As was expected, the reduced freight rate has not stimulated the market and has had virtually no effect in bringing out orders for shipment from the docks. Not a new inquiry for ore or sale is reported since the announcement of the rate reduction. Only one new shipping order is reported, that being for only 8000 tons and coming from a consumer who stated that he would take that amount of ore this fall instead of waiting until spring. Consumers have large stocks in their furnace yards, many of them enough to last until spring, so the lower railroad rates are not expected to bring out many shipping orders during the early winter. While the railroads announce that the new rates are to remain in effect only until Jan. 1, ore people and consumers are confident that the railroads will not restore the old rates at the latter date. The amount of lake ore in interior furnace yards, including both those in the central district and at Eastern furnaces, was slightly under 16,000,000 tons Sept. 1, when the last figures were compiled, but is now considerably in excess of that amount, which indicates that little ore need be shipped off the docks before next spring. The announcement of the lower rail rates has resulted in the holding back of some shipments until the new rates become effective. The lake movement is slowing up, as all shippers are cleaning up on their contracts. However, a little ore will be moved in November unless the

threatened railroad strike goes into effect. The Steel Corporation is planning to finish shipping ore Oct. 29. After the 40 per cent freight advance on ore in 1920, a corresponding advance was made in dock charges for handling ore. A reduction in these charges is not included in the 28 per cent reduction in rail rates and ore shippers and consumers have taken steps to attempt to bring out a corresponding reduction in handling charges. The ore shippers are interested in bringing about a reduction in the rate of handling ore from the hold to the rail of the vessel, as that charge, now amounting to 14c. per ton, is borne by the ore sellers. The cost of handling from the rail to the stock pile, now 22c. a ton, is paid by the consumer. Joint committees of the representatives of the ore firms and of the consuming interests in the Pittsburgh and Youngstown districts will take this matter up with the railroads and request that these rates be correspondingly reduced. These rates are under the supervision of a committee of the ore and coal handling railroads, which meets in Pittsburgh.

We quote delivered lower lake ports: Old range Bessemer, 55 per cent iron, \$6.45; Old range non-Bessemer, 51½ per cent iron, \$5.70; Mesabi Bessemer, 55 per cent iron, \$6.20; Mesabi non-Bessemer, 51½ per cent iron, \$5.55.

Pig Iron.—The market was somewhat more active during the past week than in the previous week, but quieted down the last day or two, evidently being affected by the threatened railroad strike. On the other hand, the danger of the strike brought out a little business from consumers who want to get iron in their yards. The total sales during the week aggregated approximately 10,000 tons. A local interest sold two lots of gray forge iron, one 1200 tons and the other 500 tons, to Pittsburgh consumers at \$20 Valley furnace. As this iron will be shipped from Cleveland, the price figures back to about \$19.25 furnace. One local interest sold 4200 tons and another 2500 tons, practically all in foundry grades, in lots of 500 tons and under. Prices quoted by lake furnaces are unchanged at from \$20 to \$21 for No. 2 foundry, the former being the more general quotation. The \$21 price that has been generally quoted recently by Valley furnaces is evidently being shaded and there are reports of Valley quotations as low as \$20 on foundry iron. However, a 1000-ton lot for central Ohio delivery was taken by a Cleveland furnace at \$20.50. Two inquiries for basic iron have come out, one from Pittsburgh and the other from Middletown, Ohio, each for 2000 tons. A northern Ohio foundry is about to close for 2000 tons of foundry iron. We note the sale of 100 tons of malleable at \$20.50. Low phosphorous iron is a little firmer, two or three sales in lots up to 300 tons being reported at \$35. Shipments show a slight gain over September. Stocks in furnace yards are being gradually reduced. Reports indicate that the total shipments of iron by merchant furnaces throughout the country during September were double the amount produced and that the stocks on hand in furnace yards Oct. 1 were about 750,000 tons, or less than one month's production at full operation.

Quotations below are f.o.b. local furnace for northern foundry iron, not including a 56c. switching charge. Other quotations are delivered Cleveland, being based on a \$1.96 freight rate from Valley points, a \$3.36 rate from Jackson and a \$6.67 rate from Birmingham:

Basic	\$21.21
Northern No. 2 fdy., sil. 1.75 to 2.25 ..	\$20.50 to 21.00
Southern fdy., sil. 2.25 to 2.75	26.17
Ohio silvery, sil. 8 per cent	32.86
Standard low phos., Valley furnace ..	35.00

Semi-Finished Steel.—An inquiry is pending for 2000 tons of sheet bars on which prices seem to be firmly held at \$32. Slabs are being offered at \$30, but small lot sales of surplus mill stock are reported at \$28.

Finished Iron and Steel.—Orders for all finished lines were light during the week and involved only small lots. Prices on most lines are unchanged, the market lacking firmness in spite of efforts of some mills to get higher prices. Steel bars are selling in small lots of 1.60c. On plates and structural material quotations range from 1.60c. to 1.65c. Two or three independent mills that are quoting to 1.75c. for plates find themselves out of line with the market. However, in spite of this situation, one Valley mill has advanced its price on plates

to 1.85c. The building field shows little life, the only new inquiry being for 275 tons of structural steel for the South High School, Toledo. Hard steel reinforcing bars are in fair demand in lots up to 100 tons, but prices have further weakened, sales being made at 1.50c, although the usual minimum quotation is 1.55c. Light rails are weak, quotations as low as 1.55c. being reported. Hot-rolled strip steel is a little firmer, one Valley mill now holding to 2.25c. A local inquiry has come out for 500 tons of sheet steel piling.

Jobbers quote steel bars, 2.64c.; plates and structural shapes, 2.74c.; No. 9 galvanized wire, 3.50c.; No. 9 annealed wire, 3.25c.; No. 28 black sheets, 3.75c.; No. 28 galvanized sheets, 4.75c.; No. 10 blue annealed sheets, 3.10c.; hoops and bands, 3.29c.; cold-rolled rounds, 3.85c.; flats, squares and hexagons, 4.35c.

Sheets.—Sheet mills are rather slow in falling in line in the \$5 a ton price advance made Oct. 15 by a few of the independent mills. Several mills are still quoting the old prices of 3c. for black and 4c. for galvanized. The advance was not put on blue annealed sheets, which are still quoted at 2.50c. for the lighter and 2.25c. for the heavier gages. The advance seems to have accomplished its purpose of bringing out considerable tonnage in small lots at the old prices.

Warehouse Business.—Jobbers report some improvement in warehouse business. All prices are unchanged.

Coke.—There is a little activity in foundry coke for prompt shipment and prices are firm. Some sales of standard Connellsville foundry coke are being made at \$4.75 for prompt shipment, the same producers asking \$5 for contracts.

Bolts, Nuts and Rivets.—Bolt and nut manufacturers report a fair volume of orders with sales somewhat in excess of those during September. Business is coming from jobbers and from various classes of consumers, with the exception of the implement trade. Prices appear to be holding fairly firm. The demand for rivets shows a little improvement and prices are well maintained at 2.40c. for structural and 2.50c. for boiler rivets. The improved demand is mostly from the car companies. Makers are asking \$2 a ton advance over regular quotations for contracts for the remainder of the year.

Old Material.—The market stiffened up somewhat during the week and prices were marked up on a few grades. However, evidently as a result of the threatened railroad strike, a weaker tendency has developed during the past day or two, although as a rule recently prevailing prices are being maintained. Activity is still confined to outlying districts and the transactions reported are purchases by dealers to cover recent mill orders. Compressed steel sold as high as \$12.25 for Youngstown delivery, but later small lots were sold at \$11.75 for the same consuming point. Sales of heavy melting steel at \$14, cast borings at \$10.75 to \$11 and machine shop turnings at \$8.75 to \$9 to dealers in the Youngstown district are reported.

We quote per gross ton, f.o.b. Cleveland, as follows:

Heavy melting steel.....	\$12.00 to \$12.50
Steel rails, under 3 ft.....	12.75 to 13.25
Steel rails, rerolling.....	15.00 to 15.50
Iron rails.....	11.00 to 12.00
Iron car axles.....	18.00 to 19.00
Low phosphorus melting scrap.....	12.50 to 13.00
Cast borings.....	8.65 to 8.85
Machine shop turnings.....	6.60 to 7.00
Mixed borings and short turnings.....	7.00 to 7.50
Compressed steel.....	9.50 to 9.75
Railroad wrought.....	12.00 to 12.50
Railroad malleable.....	12.00 to 12.75
Light bundled sheet stampings.....	6.25 to 6.60
Steel axle turnings.....	9.25 to 9.75
No. 1 cast.....	16.00 to 16.50
No. 1 busheling.....	8.25 to 8.75
Drop forge flashings, over 10 in.....	8.00 to 8.50
Drop forge flashings, under 10 in.....	8.00 to 8.50
Railroad grate bars.....	12.75 to 13.00
Stove plate.....	13.00 to 13.25
Pipes and flues.....	8.50 to 9.00

The National Sheet & Tin Plate Manufacturers' Association is the latest addition to the list of organizations affiliating with the National Industrial Conference Board, whose headquarters are at 10 East Thirty-ninth Street, New York.

Buffalo

BUFFALO, Oct. 18.

Little evidence exists that the prospective railroad strike scheduled for Oct. 30 has brought about an unusual condition in this district. Sufficient time has not elapsed to show any effect on shipping instructions or sales and the general impression is that the strike will be averted or, if it does occur, it will be of short duration. None of the mills have taken any action and will operate on the present scale without change. Warehouse business is expected to show some improvement as Oct. 30 approaches if the strike still appears inevitable. Orders for material would be more than likely to be offered warehouses in preference to mills, as the margin of time is too short to permit mill activity on new business and have shipment completed within the time allotted. In few instances have producers found anxiety. Two large pig iron buyers found it advisable to urge a furnace to accelerate shipment and double quantities placed in transit daily.

Pig Iron.—The unusual situation wherein two producers are out of the market is already reflected in the small volume of sales. About 4000 tons have been booked as new business. The Donner Steel Co. will have another furnace in blast within the week; the one furnace now blowing on foundry iron will be changed to basic production and the one going in will be used for foundry iron to fill orders now on file. One producer sold 2000 tons—scattered, and at \$20 base. The same interest has inquired for 6500 tons and is quoting \$20.50 for malleable and maintaining the 50c. differential for each 50 point advance in silicon. A few hundred tons, taken to mean less than 1000 tons, has been sold by one interest which has done little this year but has not diminished production and is storing the greater part of the output of one furnace. Pig iron made by a combined steel and iron interest has not moved in keeping with previous sales records this fall. Seven stacks are now blowing in this district, including a second Susquehanna just blown in.

We quote f.o.b. dealers' asking prices per gross ton Buffalo as follows:

No. 1 foundry, 2.75 to 3.25 sil.....	\$21.00 to \$22.00
No. 2X foundry, 2.25 to 2.75 sil....	20.50 to 21.50
No. 2 plain, 1.75 to 2.25 sil.....	20.00 to 21.00
Basic (nominal)	21.00
Malleable	21.00 to 22.00
Lake Superior charcoal.....	31.75

Finished Iron and Steel.—A firmer market on bars and sheets, the latter due to expected increase in prices, is seen. There is reluctance on the part of sellers to quote less than 1.65c. on bars whereas a week ago buyers were frank in stating they could buy without difficulty at 1.60c. A number of prospective purchasers of reinforcing bars have sought to cover for next year's delivery on the basis of the present market, but one mill has rejected terms of this kind. Sheet prices are quoted for immediate acceptance only and are withdrawn if the order is not forthcoming on receipt of the quotation. The sheet situation is firmer and a local mill which has seven sheet mills in operation on a 50 per cent basis, has sufficient business booked to warrant the same scale of operation the rest of the year. Pipe orders for small sizes hold to the same satisfactory average as previously reported. A bar maker has picked up a few small orders, but no sizable tonnage has appeared. A satisfactory increase in the wire department of the Steel Corporation's Buffalo branch is reported.

Warehouse Business.—Better demand for bars and an improvement in orders for car materials are new developments. Generally the demand for all products is increasing. There is some inconsistency in automobile work. Buffalo auto plants are fairly active, but at points west of Buffalo there has been a curtailment which is felt in certain warehouse business. Sheet prices are quoted only for immediate acceptance, as

a further advance is expected. A reduction in the price of cold-rolled strip steel is announced.

We quote warehouse prices f.o.b. Buffalo as follows: Structural shapes, 2.90c.; plates, 2.90c.; plates, No. 8 gage, 3.25c.; soft steel bars and shapes, 2.80c.; hoops, 3.50c.; blue annealed sheets, No. 10, 3.55c.; galvanized steel sheets, No. 28, 5.25c.; black sheets, No. 28, 4.25c.; cold-rolled strip steel, 6.40c.; cold-rolled round shafting, 5.90c.

Coke.—Interest in coke purchases has waned to some extent and the activity recently noticed has abated. Prices are firm and best grades are quoted at \$4.50 to \$5.50, ovens.

Old Material.—A number of sales of heavy melting steel have been made and the total movement is about 5000 tons. The highest price ascertained is \$13.50. Most of the mills have participated in this movement and on the whole the market is freer. None of the sales exceeded 500 tons.

We quote dealers' asking prices per gross ton f.o.b. Buffalo as follows:

Heavy melting steel.....	\$13.00 to \$14.00
Low phos., 0.004 and under.....	16.00 to 17.00
No. 1 railroad wrought.....	13.00 to 14.00
Car wheels.....	14.00 to 15.00
Machine shop turnings.....	6.00 to 7.00
Cast iron borings.....	6.00 to 7.00
Heavy axle turnings.....	9.00 to 10.00
Grate bars.....	10.50 to 11.00
No. 1 busheling.....	10.00 to 11.00
Stove plate.....	13.00 to 14.00
Bundled sheet stampings.....	7.00 to 8.00
No. 1 machinery cast.....	16.00 to 17.00
Hydraulic compressed.....	10.00 to 10.50
Railroad malleable.....	12.00 to 13.00

St. Louis

St. LOUIS, Oct. 18.

The threatened railroad strike has not produced any increased demand so far for iron or steel in the St. Louis industrial district. There has been no greater buying of pig iron, although some consumers have increased their shipping specifications for orders already placed. Producers in the district could take care of some of their trade by means of motor truck transportation. The fabricators and other users of steel seem little interested in the strike or its effects, as they have some stock on hand and are not well booked with orders. Prompt shipment of orders already placed has been asked in a few instances. Warehouse stocks are fairly large and they are well able to take care of their trade for some time. Railroads themselves continue to buy. Ore could be transported by the Mississippi River barge line.

Pig Iron.—The price of \$21 Chicago, a drop of \$1 a ton, announced last week, has been met by the St. Louis Coke & Chemical Co., and sales were made on that basis. Some of the Chicago furnaces are maintaining the old price, however, because of being well booked ahead with orders. The lower prices are in anticipation of lower assembling costs. The Granite City producer sold 300 tons of foundry iron on the basis of the lower price. A Kansas melter has an inquiry out for 500 tons of foundry iron, and there is another inquiry out for 400 tons for a foundry making railroad castings. There was a fairly good run of inquiries for a carload up to 100 tons. The melt in the St. Louis industrial district is steadily increasing. The National Stamping & Enameling Co. is now operating five furnaces. It is understood that it had on hand about 19,000 tons of iron, a melt of about 45 days. Prices on a car each of ferromanganese and ferrosilicon for prompt shipment have been asked.

We quote delivered consumers' yards St. Louis as follows, having added to furnace prices \$2.88 freight and war tax from Chicago and \$5.91 from Birmingham:

Northern foundry, sil. 1.75 to 2.25.....	\$23.88
Northern malleable, sil. 1.75 to 2.25.....	23.88
Basic.....	23.88
Southern foundry, sil. 1.75 to 2.25.....	24.91

Finished Iron and Steel.—Plans for Hotel Cecil, involving 400 tons of reinforcing bars, and the Christian Brothers College, between 40 and 50 tons of bars, are now in the hands of contractors. Both jobs call for re-rolled bars, giving local manufacturers an advantage. B. F. Bush, president of the Missouri Pacific, has announced that surveys have begun for double tracking the line between St. Louis and Jefferson City, a dis-

tance of 106 miles, involving the expenditure of \$2,000,000, but so far no inquiries have been made covering the rails and other steel necessary. That road is buying more freely, however, than any other line in this district. Last week it bought 75 tons of plates, and a small quantity of sheets. The Union Pacific has an inquiry out for a carload of axles, and the Missouri, Kansas & Texas Railroad is in the market for a carload of plates. An unusual inquiry, in that one of that size should come from a jobber, was for 600 tons of reinforcing bars from a Dallas, Tex., concern. The demand for sheets is active and a fair volume of sales was made during the week to railroads, wholesale hardware houses and manufacturers. Sales during September were the best in many months, being largely roofing stock. A Western concern bought 200 tons of wire rods. There is no change in the warehouse situation.

For stock out of warehouse we quote: Soft steel bars, 2.87½c. per lb.; iron bars, 2.87½c.; structural shapes, 2.97½c.; tank plates, 2.97½c.; No. 10 blue annealed sheets, 3.47½c.; No. 28 black sheets, cold rolled, one pass, 4.10c.; cold drawn rounds, shafting and screw stock, 4.20c.; structural rivets, \$3.77½ per 100 lb.; boiler rivets, \$3.87½; tank rivets, 7/16 in. and smaller, 60-10 per cent off list; machine bolts, large, 65 per cent; small, 60 per cent; carriage bolts, large, 50-5 per cent; small, 55 per cent; lag screws, 60 per cent; hot pressed nuts, square or hexagon blank, \$3.25; and tapped, \$3.00 off list.

Coke.—The coke situation is much better. The St. Louis Coke & Chemical Co. reports the sale of 15,000 tons of furnace coke to a Western smelter, it being understood that the order was placed at a price figured on the market quotations on Connellsville foundry, \$3.50 to \$3.75. Illinois interests have an inquiry out for 60,000 tons of furnace coke for shipment within 12 months, and it is expected that this deal will be closed during the week. There is more buying for stove manufacturers, foundries doing railroad work and steel mills. Standard Connellsville foundry coke is firm at \$4.75 to \$5.50.

Old Material.—There is no change in the prices of old materials this week. Dealers have not been so eager to boost prices, as was the case the previous week, for the reason that consumers will not meet the advances and are virtually out of the market at prevailing prices. While there has been no reduction from previous quotations, the market is, if anything, a little softer. The mills report a better volume of business, but say that the prices they are receiving for their product does not warrant them in paying the prices asked for old material by the dealers. Current railroad offerings include: Chicago, Cleveland, Cincinnati & St. Louis, 1250 tons; Chicago, Rock Island & Pacific, 5000 tons; Nashville, Chattanooga & St. Louis, 600 tons; Mobile & Ohio, 800 tons.

We quote dealers' prices, f.o.b. consumers' works, St. Louis industrial district and dealers' yards, as follows:

Per Gross Ton	
Iron rails.....	\$15.50 to \$16.00
Steel rails, rerolling.....	13.50 to 14.00
Steel rails, less than 3 ft.....	13.00 to 13.50
Relaying rails, standard section.....	30.00 to 32.00
Cast iron car wheels.....	15.50 to 16.00
No. 1 heavy railroad melting steel.....	12.00 to 12.50
No. 1 heavy shoveling steel.....	11.50 to 12.00
Ordinary shoveling steel.....	11.00 to 11.50
Frogs, switches and guards, cut apart.....	12.00 to 12.50
Ordinary bundle sheet.....	7.00 to 7.50

Per Net Ton	
Heavy axles and tire turnings.....	\$7.50 to \$8.00
Iron angle bars.....	13.00 to 13.50
Steel angle bars.....	11.00 to 11.50
Iron car axles.....	20.00 to 20.50
Steel car axles.....	15.50 to 16.00
Wrought iron arch bars and transoms.....	15.50 to 16.00
No. 1 railroad wrought.....	12.00 to 12.50
No. 2 railroad wrought.....	11.00 to 11.50
Railroad springs.....	13.00 to 13.50
Steel couplers and knuckles.....	13.00 to 13.50
Locomotive tire, 42-in. and over, smooth inside.....	10.00 to 10.50
No. 1 dealers' forge.....	10.00 to 10.50
Cast iron borings.....	7.50 to 8.00
No. 1 busheling.....	11.00 to 11.50
No. 1 borings cut 'in sheets and rings.....	8.00 to 8.50
No. 1 railroad cast.....	15.00 to 15.50
Stove plate and light cast.....	12.00 to 12.50
Railroad malleable.....	11.50 to 12.00
Agricultural malleable.....	10.50 to 11.00
Pipes and flues.....	8.50 to 9.00
Heavy railroad sheet and tank.....	8.00 to 8.50
Light railroad sheet.....	5.50 to 6.00
Railroad grate bars.....	10.50 to 11.00
Machine shop turnings.....	6.00 to 6.50
Country mixed iron.....	8.00 to 8.50
Uncut railroad mixed.....	9.00 to 9.50
Horseshoes.....	11.00 to 11.50
Railroad brake shoes.....	10.50 to 11.00

Birmingham

BIRMINGHAM, ALA., Oct. 18.

The only effect of the railroad strike on the Birmingham iron market has been the receipt of orders from scattering customers to anticipate shipments. These, as a rule, are from far away and small consumers. Large pipe interests lately purchased large tonnages. These are now moving to yards and the companies seem generally well supplied for some time ahead.

The Birmingham iron makers report a brisk influx of new orders but little has developed pointing to anxiety as to deliveries. The most apparent anxiety is with regard to foundry coke. Rush orders have come in asking anticipation of shipments, but there is no marked feeling of anxiety.

Pig Iron.—After active selling during two weeks, Birmingham iron makers settled down to a steady influx of 100 to 500-ton lots, all bringing \$19 and the differentials. Among the largest transactions of the ten days preceding the past week was the placing of orders for approximately 20,000 tons by the leading pipe interest. Three different interests are known to have gotten 5000 to 7000 tons each. Another considerable order was 1200 tons placed by the American Radiator Co. One maker is now fully booked for the remainder of the year and has as much first quarter business as it cares to take. The other interests have done very little 1921 business, but all have taken some. The base is the same as for prompt iron. Furnace resumption that was scheduled took place, the Alabama Co., Woodward Iron Co. and Republic Iron & Steel Co. blowing in a stack each and the Shelby Iron Co. and the Bass Iron Co. blowing in a charcoal iron stack each. Total active stacks in Alabama have grown from five on Aug. 1 to 12, the active ones being four of the Tennessee company on basic, three of the Woodward Iron Co. on foundry, one each of the Alabama Co., Republic Iron & Steel Co. and Central Iron & Coal Co. on merchant iron and one each of the Shelby Iron Co. and the Bass Iron Co. on charcoal iron. The strategic situation was strengthened by reduction of foundry stocks from 88,000 to 68,000 tons in the month of September and reduction of total stocks from 188,000 to 165,000. Only one maker has well-assorted stocks. Five, including one large maker, had none at the beginning of the month. Several Indiana and Ohio foundries have purchased 200 to 500 tons for first quarter delivery. The melt in the South increases week by week and there is no apparent danger of overproduction.

Cast Iron Pipe.—J. R. McWane, president American Cast Iron Pipe Co., is organizing the McWane Iron Pipe Co., which will manufacture special designs of cast iron pipe. He has leased a plant and will later build. John F. Eagan, of Atlanta, chairman of the board of the American Cast Iron Pipe Co., will become president Jan. 1, Mr. McWane remaining on the board as advisory director. Both high pressure and sanitary pipe are active with all the high pressure plants in operation and most of the others. The Iron City Pipe & Foundry Co. announces full turn and shipment of heavy tonnages of sanitary pipe to New York City. High pressure base is \$35 and sanitary pipe base \$40 with as low as \$30 for extra heavy and \$45 for fittings.

Finishing Mills.—The Tennessee company is on double turn this week in the Fairfield structural mill and the blooming and rail mills at Ensley. The plate mill at Bessemer, car works at Fairfield, tie-plate plant at Fairfield and bar and guide mills at Bessemer are also operating. The fifth of the six open-hearth furnaces at Ensley went on this week. That indicates 75 to 80 per cent of operations in the finishing mills. The Gulf States Steel Co. is at 70 per cent of capacity with nails leading on the order sheets.

Coal and Coke.—There is good demand for steam and domestic coal and production has gotten to 235,000 tons per week compared with a low of 165,000 tons. Much coke is going to Mexican smelters at Monterey with some shipments to the Pacific Coast. A consign-

ment of 5000 tons for export is moving to New Orleans. Alabama By-Products Co. is on full turn and Semet-Solvay has resumed at 60 ovens to make coke for the Alabama Co. Woodward Iron Co. has brought in additional by-product batteries.

Old Material.—Cast scrap is moving in good quantities and the market is fairly active, but steel scrap is slow to issue from yards owing to the limited demand incident to the few customers capable of being reached by local dealers.

We quote per gross ton f.o.b. Birmingham district furnaces, as follows:

Foundry, silicon 1.75 to 2.25.....	\$19.00
Basic	18.00
Charcoal warmblast	35.00

We quote per gross ton f.o.b. Birmingham district yards as follows:

Steel rails	\$11.00 to \$12.00
No. 1 steel	10.00 to 11.00
No. 1 cast	15.00 to 16.00
Car wheels	15.00 to 16.00
Tramcar wheels	12.00 to 13.00
No. 1 wrought	13.00 to 14.00
Stove plate	11.00 to 12.00
Cast iron borings	6.00 to 7.00
Machine shop turnings	6.00 to 7.00

Boston

BOSTON, Oct. 18.

Pig Iron.—Owing to the threat of strikes Nov. 2, 3 and 4 on the New England railroads, buyers who have contracts for iron are asking furnaces to rush shipments. It seems that some buyers have had inside strike information for two or three weeks past and have been especially active in getting material on the way. The textile interest which opened bids on Oct. 10 for 3000 tons of No. 2 X iron has bought its requirements at approximately \$25, delivered eastern Massachusetts. This would mean \$19.50, furnace, on its Buffalo purchases, and \$21, furnace, for eastern Pennsylvania. The sale illustrates that an attractive inquiry will bring out quotations \$1 a ton less than the theoretical market. Otherwise, \$20, furnace base, Buffalo, and \$20.50, eastern Pennsylvania, prevail here. The week has been exceptionally quiet from the standpoint of inquiries and sales. The Walworth Mfg. Co. asks for 250 tons of No. 2 X and a carload of malleable. Buyers are urging the speeding of shipments before the winter sets in and a railroad strike develops. In referring to sales by a Northern furnace at a "price lower than \$19, base furnace," in these columns last week, the statement should have read: "Equivalent to lower than \$19, furnace base, eastern Pennsylvania." It is understood the price was about \$19.50, furnace.

East. Penn., silicon 2.25 to 2.75.....	\$24.56 to \$26.06
East. Penn., silicon 1.75 to 2.25.....	24.06 to 25.56
Buffalo, silicon, 2.25 to 2.75.....	25.96 to 26.49
Buffalo, silicon 1.75 to 2.25.....	25.46 to 25.96
Virginia, silicon 2.25 to 2.75.....	30.08 to 31.08
Virginia, silicon 1.75 to 2.25.....	29.58 to 30.58
Alabama, silicon 2.25 to 2.75.....	30.16
Alabama, silicon 1.75 to 2.25.....	29.66

Cast-Iron Pipe.—Business is slowing down because of the season of the year. There is considerable buying, however, by water departments and companies which are short of pipe and who wish stocks to tide over the winter. Some municipalities have been securing lower prices by negotiating directly and quietly with individual makers, rather than inviting public bids. We quote per net ton in carload lots, f.o.b. Boston and district, as follows: 3-in., \$66.70; 4-in., \$56.70; 6-in., \$50.70; 10-in. and larger, \$49.70.

Finished Steel.—A group of building contracts, either just awarded, or about to be, will call for about 20,000 tons of structural steel. On Oct. 13 the building of a new high school for Springfield, Mass., was awarded to Fred T. Ley & Co. for \$461,750. Other constructions to be awarded soon are: Harris Forbes building, Boston; Back Bay telephone building, Boston; high school, Providence. Shapes are quoted from 1.60c. to 1.75c. Though bars are still sold as low as 1.50c., the more frequent quotation is 1.60c. Awards to fabricators have been light, the largest being a 4-story building in Concord, N. H., requiring 75 tons.

Warehouse Business.—Reflecting the mill raise of \$5 a ton on sheets, the local jobbers have raised their prices accordingly, No. 28 black being changed from

\$4.25 to \$4.50; No. 28 galvanized from \$5.25 to \$5.50. Sales are improving slowly. The best demand is for sheets, plates and bars.

Jobbers now quote: Soft steel bars, \$2.81½ per 100 lb. base; flats, \$3.83 to \$3.93; concrete bars, \$2.50 to \$3.09; tire steel, \$4.20 to \$4.70; spring steel, open hearth, \$5.25; crucible, \$11.50; steel bands, \$3.46½ to \$3.98; steel hoops, \$4.18; toe calk steel, \$5.25; cold rolled steel, \$3.90 to \$4.30; structural steel, \$2.81½ to \$2.96½; plates, \$2.91½ to \$3.10; No. 10 blue annealed sheets, \$3.73; No. 28 black sheets, \$4.50; No. 28 galvanized sheets, \$5.50; refined iron, \$2.83 to \$4.75; best refined, \$4.75; Wayne iron, \$6.50; Norway iron, round, ¼-in. to 2½-in., 5.75c. to 6.75c. per lb. net; other sizes, 7.75c. base.

Coke.—The statement is accredited to an official of a local coke producer that last month was the best from the standpoint of volume of sales of any month in its history. In general the situation is improving. The price stiffening in the Connellsville district makes the status of the New England producers more favorable. The delivered in New England price is \$10.66, where the local freight is \$3.40.

Old Material.—Better business is still in the sentimental stage only. Better sentiment keeps the price tendency upward. It develops that the \$15 offered for heavy melting steel in the Pittsburgh district is for brokers short of material, rather than the mills. Brokers are not doing much business in cast scrap here because the little demanded can be supplied to foundries by local producers shipping in trucks. One broker has offered \$19 delivered for No. 1 machinery cast, which he would sell to foundries at \$19.50. Offers for more than \$7.50 have been made for heavy melting steel.

The following prices are for gross ton lots delivered consuming points:

No. 1 machinery cast.....	\$18.50 to \$20.00
No. 2 machinery cast.....	16.50 to 17.50
Stove plate	16.50 to 17.00
Railroad malleable	13.50 to 14.50

The following prices are offered per gross ton lots f.o.b. Boston rate shipping points:

No. 1 heavy melting steel.....	\$7.00 to \$7.75
No. 1 railroad wrought.....	10.00 to 10.50
No. 1 yard wrought.....	8.00 to 8.50
Wrought pipe (1-in. in diameter, over 2 ft. long).....	8.00 to 8.50
Machine shop turnings.....	3.50 to 4.00
Cast iron borings, rolling mill.....	4.00 to 4.75
Cast iron borings, chemical.....	5.00 to 5.25
Blast furnace borings and turnings.....	2.75 to 3.25
Forged scrap and bundled skeleton.....	4.50 to 5.00
Street car axles and shafting.....	12.00 to 13.00
Car wheels	13.00 to 14.00
Rerolling rails	9.00 to 10.00

Philadelphia

PHILADELPHIA, Oct. 18.

The prospective railroad strike is naturally the chief subject of interest this week in the local pig iron and steel trade. Consumers are apparently not fully convinced that the threatened strike will really take place, for there has been very little effort so far to anticipate a railroad tie-up by the placing of rush orders for material. There is not the fear of a railroad strike that might be if the steel and iron industry was working at full capacity; few believe that with millions of men unemployed the railroads could be seriously crippled for long. Moreover, there is a majority who believe that a railroad strike would not be wholly a calamity and that an early settlement of the fundamental differences between railroad executives and workmen is better than a mere postponement of the issue. A victory for the railroads is freely predicted.

The local market has been quiet during the past week, there being no outstanding developments.

Pig Iron.—A further decline in the volume of pig iron business has occurred in the past week. Many consumers have covered their requirements for the remainder of the year and little activity is expected until the furnaces open their books for first quarter, unless the threatened railroad strike should scare some consumers into the market for spot shipments to prevent stoppage of work at their plants in the event the railroads are seriously crippled. There have been several informal inquiries regarding first quarter iron, but the furnaces now in blast are not disposed to consider business for that period at this time. The active furnaces are comfortably well off for the remainder of the year and prefer a policy of awaiting developments before fixing upon a selling policy for first

quarter. Prices of foundry iron continue firm. At least two sellers are offering No. 2 plain iron at \$20.50, furnace, with freight rates of \$1.40 and \$1.54 to Philadelphia, while others quote a base price of \$21. The extra for No. 2X iron is 50c. in some instances and \$1 in others. There are no developments in other grades of iron. The Hellertown furnace of the Thomas Iron Co. was to have been put in blast Sunday, but the threatened railroad strike caused a postponement. It is reported that an Eastern cast iron pipe manufacturer has bought 2000 tons of Belgian iron.

The following quotations are, with the exception of those on low phosphorus iron, for delivery at Philadelphia, and include freight rates varying from 84 cents to \$1.54 per gross ton:

East. Pa. No. 2 plain, 1.75 to 2.25 sil....	\$21.90 to \$22.26
East. Pa. No. 2X, 2.25 to 2.75 sil....	22.40 to 23.26
Virginia No. 2 plain, 1.75 to 2.25 sil....	27.74 to 28.74
Virginia No. 2X, 2.25 to 2.75 sil....	28.24 to 29.74
Basic deliv. eastern Pa.....	20.50
Gray forge	20.50 to 21.50
Malleable	24.00 to 25.00
Standard low phos. (f.o.b. furnace)...	36.50
Copper bearing low phos. (f.o.b. furnace)	35.00

Ferroalloys.—A British selling agent has been attempting to execute a pool order for about 10,000 tons of ferromanganese at \$50, seaboard, declaring that with this sale consummated the price would immediately be advanced. So far as known, the attempt has not met with success. Meanwhile, quotations continue at \$58.35, seaboard, for both imported and domestic. Talk of German sales of ferromanganese in this country continues, but with the exception of one sale of 100 tons reported a few weeks ago there is no definite information that sales have been made. Spiegeleisen is not in demand and is quoted from \$25 to \$27, furnace.

Semi-Finished Steel.—A few small sales of billets have been made in the past week. Though the usual quotation is \$30 for rerolling and \$35 for forging billets, these prices have been shaded \$1 a ton on some transactions.

Plates.—While the plate market is still very inactive, there is a slight gain in orders, but the best that any of the Eastern plate mills are able to do is 20 to 25 per cent operation. Through the determination of makers to cut down their losses, there has been a slight stiffening in the price, the regular quotation now being 1.65c., Pittsburgh, with some mills quoting 1.75c. on small lots. However, it is still possible to do 1.60c. on desirable specifications and some buyers intimate that they can shade 1.60c. The Baldwin Locomotive Works has received an order from the Argentine for 75 locomotives, requiring about 2000 tons of plates. Domestic inquiries for locomotives now being figured upon total 125 to 150.

Structural Shapes.—No change has taken place in the demand for shapes, which continues only fair and far from the capacity of plants. Prices quoted range from 1.60c. to 1.65c., Pittsburgh, with the latter figure in most quotations.

Bars.—The demand for steel bars is light. Sales are being made generally at 1.60c., Pittsburgh, though there are still reports of an occasional sale as low as 1.50c. Bar iron is quoted at 1.60c., Pittsburgh, but this is being shaded at least \$1 a ton by one or two small mills.

Sheets.—It is evident that the efforts of the sheet manufacturers to raise prices have not been wholly successful. The advance of some weeks ago to 2.50c. for blue annealed, 3c. for black and 4c. for galvanized had not become universal up to last week, and the further advance of \$5 a ton, which was put into effect Saturday last by some makers, has not been confirmed by sales. Up to the middle of last week, at least, it was possible to procure sheets at 2.25c. for blue annealed, 2.75c. for black and 3.75c. for galvanized. The latest advance may have the effect, it is believed, of bringing up the prices of the low sellers to 2.50c., 3c. and 4c., but these quotations will still be \$5 a ton below the newly announced levels of 2.75c., 3.25c. and 4.25c.

Spikes.—A fair demand exists for railroad spikes. The Norfolk & Western has issued an inquiry for 700

kegs for prompt shipment and 7000 kegs for first half of next year. Railroad spikes are quoted at 2.50c., Pittsburgh, per lb.

Bolts.—Makers assert that bolt prices are firm on the basis of 65, 10 and 5 per cent off for large machine bolts.

Rivets.—Prices are firmer, with structural rivets quoted at 2.50c. and boiler quality at 2.60c., Pittsburgh.

Warehouse Business.—A moderate improvement in buying steel out of stock continues. Prices for Philadelphia are given, the quotations on sheets being the minimum, some houses asking more:

Soft steel bars and small shapes, 2.75c.; iron bars (except bands), 2.50c.; round-edge iron, 2.80c.; round edge steel, iron finish, $1\frac{1}{2}$ x $\frac{1}{2}$ in., 3.05c.; round edge steel planished, 3.80c.; tank steel plates, $\frac{1}{4}$ -in. and heavier, 2.85c.; tank steel plates, $3/16$ -in., 3.035c.; blue annealed steel sheets, No. 10 gage, 3.25c.; light black sheets, No. 28 gage, 3.75c.; galvanized sheets, No. 28 gage, 4.75c.; square twisted and deformed steel bars, 2.75c.; structural shapes, 2.85c.; diamond pattern plates, $\frac{1}{4}$ -in., 4.60c.; $3/16$ -in., 4.785c.; $\frac{1}{2}$ -in., 4.90c.; spring steel, 4.10c.; round cold-rolled steel, 3.75c.; squares and hexagons, cold-rolled steel, 4.25c.; steel hoops, No. 13 gage and lighter, 3.65c.; steel bands, No. 12 gage to $3/16$ -in., inclusive, 3.40c.; iron bands, 3.90c.; rails, 2.75c.; tool steel, 8c.; Norway iron, 5c.; toe steel, 4.50c.

Old Material.—A slight activity began early last week, but had dwindled almost to nothing by the end of the week. Heavy melting steel is higher in price, \$12.50 having been paid by one Eastern mill and \$13 by another. A western Pennsylvania mill has paid \$10.50 for blast furnace borings and turnings, and while they can be obtained somewhat cheaper in the eastern Pennsylvania district, due to freight rate advantage, they are higher here than a week ago. Car wheels have been sold at \$17 and \$17.50, delivered, during the week. Railroad grate bars have been sold at \$14.25, delivered. We quote prices for delivery at consuming points in this district as follows:

No. 1 heavy melting steel.....	\$12.50 to \$13.00
Scrap rail	12.50 to 13.00
Steel rails, rerolling	16.00 to 16.50
No. 1 low phos., heavy 0.04 and under	16.50 to 17.50
Car wheels	17.00 to 17.50
No. 1 railroad wrought.....	16.00 to 16.50
No. 1 yard wrought.....	14.50 to 15.00
No. 1 forge fire.....	10.50 to 11.00
Bundled sheets (for steel works)....	9.50 to 10.00
No. 1 busheling	12.00 to 13.00
No. 2 busheling	10.00 to 11.00
Turnings (short shoveling grade for blast furnace use).....	8.50 to 9.00
Mixed borings and turnings (for blast furnace use)	8.50 to 9.00
Machine-shop turnings (for rolling mill and steel works use).....	8.50 to 9.00
Heavy axle turning (or equivalent)	9.50 to 10.00
Cast borings (for rolling mills)....	10.00 to 10.50
Cast borings (for chemical plants)...	10.50 to 11.00
No. 1 cast.....	17.00 to 18.00
Railroad grate bars.....	14.00 to 14.50
Stove plate (for steel plant use)....	14.00 to 14.50
Railroad malleable	12.00 to 13.00
Wrought iron and soft steel pipes and tubes (new specifications).....	13.50 to 14.00
Iron car axles.....	No market
Steel car axles.....	No market

Cincinnati

CINCINNATI, Oct. 18.

Pig Iron.—The market continues unusually quiet, carload sales being the only indication of activity. The largest sale reported was 500 tons of Chicago iron to a northern Indiana melter, the price being \$21, furnace. A sale of 200 tons to a central Ohio melter was reported on the basis of \$20, lake furnace. The only inquiry of consequence comes from a Chattanooga melter, for 1000 tons of malleable for first half delivery. A tentative inquiry for 500 tons of foundry is out, but the placing of the order is contingent on a casting order being received. The Lenoir Car Works is inquiring for 200 tons. The price situation remains unchanged, lake furnaces quoting \$20 to \$21 furnace in this territory and Chicago iron being offered at the higher figure. Ironton producers are holding firmly to \$21 for the base grade, and Southern furnaces are quoting \$19, Birmingham, for last and first quarters. Shipment of iron from furnaces during the first half of October showed a substantial gain over the same period in September, and with the possibility of a railroad

strike on Oct. 30, some melters are already asking furnaces to anticipate shipments.

Based on freight rates of \$4.50 from Birmingham and \$2.52 from Ironton, we quote f.o.b. Cincinnati:

Southern coke, sil. 1.75 to 2.25 (base)	\$23.50
Southern coke, sil. 2.25 to 2.75 (No. 2 soft)	24.00
Ohio silver, 8 per cent sil.	32.86
Southern Ohio coke, sil. 1.75 to 2.25 (No. 2)	23.52
Basic, Northern	22.52
Malleable	24.02

Finished Material.—A number of carload inquiries are being received for finished materials and in some instances orders for bars, shapes and plates totaling 100 to 200 tons have been placed. The greater part of this business is coming from jobbers who are balancing up their stocks. The sheet market is quiet and an advance of \$5.00 a ton made by several independent companies has not as yet brought out much business. It was expected that most of the independent companies would follow the lead of the Brier-Hill Steel Co. in moving up, but so far only three or four companies are quoting at the higher level. Prices on all finished materials are inclined to be firmer and while the 1.60c. price on bars has not entirely disappeared, 1.65c. was the figure at which most of the business was booked during the past week. There is still some activity in wire products and carload orders are reported as fairly numerous. In the structural field, the Big Four Railroad placed a number of bridge spans involving approximately 50 tons. The Dayton Steel Co. was low bidder on two airplane hangars at McCook Field, Dayton, Ohio, involving 180 tons. Bids closed Oct. 15 for the Catholic Club at Memphis, taking 600 tons, and 750 tons for a bridge over the Warrior River at Tuscaloosa, Ala., will likely be awarded on Oct. 19. The City of Cincinnati has awarded to the National Cast Iron Pipe Co. 200 tons of pipe. There will be little change in plant operations this week. The American Rolling Mill Co., Middletown, is operating its East Side plant on full time and the Whitaker-Glessner Co., Portsmouth, has eight sheet mills on. It is expected that the Andrews Steel Co. and the Newport Rolling Mill Co. will shortly resume as an open shop proposition. The Amalgamated Association has called a strike at the two latter plants, giving as the reason the company's refusal to negotiate and sign the local wage scales.

Warehouse Business.—No change is reported in warehouse business, which, on the whole, is regarded as fairly satisfactory. Small orders for immediate delivery constitute the bulk of the activity, although occasionally an order for 50 tons of material is booked. Jobbers' quotations are unchanged.

Iron and steel bars, 3c. base; hoops and bands, 3.75c. base; shapes, 2.85c. base; plates, 2.85c. base; reinforcing bars, 3.07 $\frac{1}{2}$ c. base; cold rolled rounds, $1\frac{1}{2}$ in. and larger, 4.10c.; under $1\frac{1}{2}$ in. and flats, squares and hexagons, 4.75c.; No. 10 blue annealed sheets, 3.50c.; No. 28 black sheets, 4.25c.; No. 28 galvanized sheets, 5c.; wire nails, \$3.25 per keg base; No. 9 annealed wire, \$3.00 per 100 lb.

Coke.—The coke market shows only occasional activity. A sale of 10,000 tons of Pocahontas furnace coke is reported, delivery to cover the next two months. The price was not divulged. Business in general, however, is confined to carload lots. Prices are firm at recent levels, though some operators are now asking 50c. above the market even for immediate shipment.

Old Material.—There is very little activity in the scrap market, though occasional inquiries for machinery cast and borings and turnings are received. Consumers in this district are out of the market, and what little business is offered comes from the Valleys. Prices are inclined to weakness without, however, any changes being quotable.

We quote dealers' buying prices:

Per Gross Ton	
Bundled sheets	\$4.50 to \$5.50
Iron rails	12.50 to 13.00
Relaying rails, 50 lb. and up.....	25.50 to 26.50
Rerolling steel rails.....	11.00 to 12.00
Heavy melting steel.....	9.50 to 10.00
Steel rails for melting.....	9.50 to 10.50
Car wheels	12.50 to 13.50
Per Net Ton	
No. 1 railroad wrought.....	9.00 to 10.00
Cast borings	3.50 to 4.00
Steel turnings	2.50 to 3.00
Railroad cast	12.50 to 13.00
No. 1 machinery.....	14.00 to 15.00
Burnt scrap	8.00 to 9.00
Iron axles	16.00 to 17.00
Locomotive tires (smooth inside)...	10.00 to 10.50
Pipes and flues.....	4.50 to 5.50

New York

NEW YORK, Oct. 18.

Pig Iron.—Except for an occasional request for anticipation of shipments of pig iron and coke, there is little indication of any effect upon the market of the threatened strike of railroad employees. Aside from this slight acceleration of shipping, the market is duller than it has been. No seller reports more than 1500 booked during the past week for delivery in the metropolitan district. Probably the largest sale was one for 700 tons of foundry iron for early delivery to a New Jersey melter. Prices show little, if any, change. While it is understood that some sales of Buffalo iron have been made at \$19.50, furnace, for No. 2X, in New England, the lowest price reported in this district is \$20. The market seems to be fairly firm at that figure. Melters of pig iron have been canvassed in the interests of French, Belgian and German pig iron. So far as known, no orders for foreign iron have been placed.

We quote delivered in the New York district as follows, having added to furnace prices \$2.52 freight from eastern Pennsylvania, \$5.46 from Buffalo and \$6.16 from Virginia:

East. Pa. No. 1 fdy., sil. 2.75 to 3.25..	\$24.52
East. Pa. No. 2X fdy., sil. 2.25 to 2.75	23.52
East. Pa. No. 2 fdy., sil. 1.75 to 2.25..	23.02
Buffalo, sil. 1.75 to 2.25.....	25.46
No. 2 Virginia, sil. 1.75 to 2.25.....	29.16

Ferroalloys.—There is no demand for ferromanganese but there has been one interesting development. The American representative of one British producer is reported to have approached certain American consumers with a proposition to take British alloy for early shipment in order to anticipate any duty and it is also said that in the event of a sufficient amount being thus sold, the price would be on a basis of \$50, seaboard, which compares with the present quotation of \$58.35. It is stated that this plan has not been successful thus far and it is also stated that domestic producers have expressed a willingness to meet a \$50 seaboard price should it be established. This development has had a tendency to hold up whatever business might have been put through. About 400 tons of spiegeleisen has changed hands at prevailing quotations. The 50 per cent ferrosilicon market has been steady with sales confined to a few carload lots. Quotations are as follows:

Ferroalloys

Ferromanganese, domestic, delivered, per ton,	\$60.00 to \$63.00
Ferromanganese, British, seaboard, per ton	\$58.35
Spiegeleisen, 20 per cent, furnace, per ton,	\$25.00 to \$26.00
Ferrosilicon, 50 per cent, delivered, per ton,	\$60.00 to \$65.00
Ferrotungsten, per lb. of contained metal.48c. to 58c.	
Ferrochromium, 6 to 8 per cent carbon, 60 to 70 per cent Cr., per lb. Cr., delivered...	14c.
Ferrovanadium, per lb. of contained vanadium	\$4.50

Ores

Manganese ore, foreign, per unit, seaboard..	20c.
Tungsten ore, per unit, in 60 per cent concentrates	\$3.00 up
Chrome ore, 40 to 45 per cent Cr ₂ O ₃ , crude per net ton, Atlantic seaboard....	\$20.00 to \$25.00
Chrome ore, 45 to 50 per cent Cr ₂ O ₃ , crude per net ton, Atlantic seaboard.....	\$30.00
Molybdenum ore, 85 per cent concentrates, per lb. of MoS ₃ , New York .....	.55c. to 60c.

Warehouse Business.—Prices are unchanged and order books as a rule look the same for the first two weeks of the current month as for the month of September. Although there is a strong effort being made in most lines to stock up from the mills in anticipation of the prospective railroad strike, few warehouses expect that any large amount of business will be stimulated by a transportation tie-up, as at present there is no business to be stimulated. The best results expected are a few larger orders from hand-to-mouth buyers, who have been purchasing for a week or two weeks at a time, and who will probably lay in stocks for a month or two. Shafting and screw stock was reduced, effective Oct. 13, to 3.88c. per lb. for rounds and 4.38c. per lb. for squares by most warehouses in this district. The situation in pipe is unchanged. Brass products have been advanced 1c. per lb. by most warehouses in the

city and some have applied this increase to copper also. The large surplus of brass scrap that has been in the market in the past has kept prices low, but there is now evidence that this scrap surplus has been considerably reduced. It is rumored that British brass scrap has been delivered at New York for as low as 4c. per lb. Just what grade of scrap it was is not known. We quote prices on page 1060.

High Speed Steel.—The market continues dull. In anticipation of the railroad strike producers are replenishing their stocks in New York district warehouses by shipments from mill stocks. Prices continue unchanged at 90c. to \$1 per lb. for 18 per cent tungsten high speed steel.

Finished Iron and Steel.—No appreciable increase in the volume of business is to be noted. If any change has occurred it is a weakness in prices. Moderate-sized tonnages are being booked at current quotations, but competition is so keen in the case of the large offerings that prices \$2 and \$3 a ton below the 1.60c. basis on the tonnage products appear to be the basis of these sales. Very commonly quotations seem to be delivered prices without regard to the Pittsburgh basis, though comparisons are still commonly made by considering the Pittsburgh freight rate to destination. A round lot of plates appears to have been sold at a mill price corresponding to 1.35c., Pittsburgh, and about 750 tons of steel bars at less than 1.40c., Pittsburgh. In some quarters these sporadic cuts are regarded as marking the end of the price decline. A fair run of fabricated steel business is noted, but no new railroad car business. The Standard Steel Car Co. is credited with 2000 cars for Argentina and the Baldwin Locomotive Co. with 85 from the same source, and the American Locomotive Co. is in the market for a round tonnage of plates for 14 locomotives for the Rock Island and others for the Missouri Pacific. New structural work includes the following: 400 tons for the Glen Alden Coal Co. office building, Scranton; 300 tons for a factory at Providence for the Textile Finishing Machine Co.; 2000 tons for nine bridges for the Philadelphia & Reading; 600 tons for a high school in the District of Columbia; 500 tons for a bridge span in the Jamaica Bay Boulevard. Recent awards include 1100 tons for the Newark Athletic Club to the Hedden Iron Construction Co.; 800 tons for the Hackensack Hospital to the Hay Foundry & Iron Works; 300 tons for a bath house at Rockaway to the Levering & Garrigues Co.; 250 tons for the French & Co. apartment; 400 tons for the J. E. Carpenter apartment, Fifth Avenue, and 2400 tons for three schools in Brooklyn, all to the McClintic-Marshall Co.; and the following to the American Bridge Co.: 350 tons for the American Car & Foundry Co. at Terre Haute, Ind.; 2800 tons for the vehicular roadway of the Manhattan bridge (for the Vulcan Rail & Construction Co.); 1100 tons for an addition to Haddon Hall, Atlantic City; 500 tons for a highway bridge over the Delaware River at Trenton, and 250 tons for a power house addition at Scranton for the Scranton Electric Co.

We quote for mill shipments, New York, as follows: Soft steel bars, 1.88c. to 2.03c.; plates, 1.98c. to 2.13c.; structural shapes, 1.98c. to 2.13c.; bar iron, 1.98c. to 2.03c. On export shipments the freight rate is now 28.5c. per 100 lb., instead of 38c., the domestic rate.

Cast-Iron Pipe.—The only municipal inquiry in this district is that of Washington for 100 tons of 12-in. pipe, bids to be opened on Nov. 7. The demand for the smaller sizes keeps up well. Plants in the North-eastern States are operating at from 50 to 70 per cent. We quote per net ton, f.o.b. carload lots, as follows: 6-in. and larger, \$47.30; 4-in. and 5-in., \$52.30; 3-in., \$62.30, with \$4 additional for Class A and gas pipe.

Old Material.—Both grades of heavy melting steel have advanced 50c. in price. A local broker is now offering \$12.75, delivered eastern Pennsylvania, for good material. It is reported that as high as \$16 has been offered for steel by Pittsburgh brokers, who were short. It grows more difficult to secure material from dealers at present prices, as they stocked up at higher prices and believe that in a few months they will be able to sell at a profit. Pipe and borings and turnings have

been active the past week. Buying by mills has not shown much improvement.

Buying prices per gross ton, New York, follow:

Heavy melting steel, yard.....	\$8.00 to \$8.50
Steel rails, short lengths, or equivalent	9.50 to 10.00
Rerolling rails	11.50 to 12.00
Relaying rails, nominal.....	37.50 to 40.00
Steel car axles.....	11.50 to 12.00
Iron car axles.....	19.00 to 20.00
No. 1 railroad wrought.....	12.00 to 12.50
Wrought iron track.....	9.50 to 10.00
Forge fire	6.00 to 6.50
No. 1 yard wrought, long.....	10.50 to 11.00
Light iron	4.50 to 5.00
Cast borings (clean).....	5.50 to 6.00
Machine-shop turnings.....	4.00 to 4.50
Mixed borings and turnings.....	3.50 to 4.00
Iron and steel pipe (1 in. diam. not under 2 ft. long).....	9.00 to 9.50
Stove plate	10.00 to 10.50
Locomotive grate bars.....	10.00 to 10.50
Malleable cast (railroad).....	8.50 to 9.00
Car wheels	12.00 to 12.50

Prices which dealers in New York and Brooklyn are quoting to local foundries, per gross ton, follow:

No. 1 machinery cast.....	\$17.00 to \$18.00
No. 1 heavy cast (columns, building materials, etc.), cupola size.....	15.00 to 16.00
No. 1 heavy cast, not cupola size.....	15.00 to 15.50
No. 2 cast (radiators, cast boilers, etc.)	10.00 to 10.50

British Iron and Steel Market

Steel Reduced to Enable Competition With Continent—Pig Iron Stagnant—Tin Plate Firmer

(By Cable)

LONDON, ENGLAND, Oct. 18.

Railroad freight rates on ore are to be reduced Nov. 1. The pig iron market is stagnant, consumers waiting for price stabilization. The foreign ore market is slightly more active with Bibao rubio quoted at 28s 6d (\$5.68), ex-ship Tees. There have been further reductions in steel enabling sellers to compete with the Continent for home business. Continental pig iron prices are stiffening with Luxemburg and French basic iron quoted at 83s to 88s (\$16.26 to \$17.24), f.o.b.

German 8-gage wire has sold at £19 (3.32c. per lb.) for January shipment and German bars at £10 (1.75c. per lb.), cost and freight to Japan, and at £9 2s 6d (1.60c. per lb.), c.i.f. India. Belgian merchant bars are held at £9 10s (1.21c. per lb.), c.i.f. India, with German wire nails at 24s (2.10c. per lb.), cost and freight to Japan. Quotations on Belgian sheets, 3/16-in., are £8 10s (1.48c. per lb.), f.o.b., delivery in three to four weeks, and those on German sheets £7 15s (3.03c. per lb.), f.o.b., with shipment in 12 weeks. Belgian billets are offered at £7 15s (\$30.38), c.i.f. Liverpool. Belgian sheet bars are held at £6 10s, f.o.b., with blooms at £6 5s (\$25.48), f.o.b.

The recent placing of the substantial order of oil size tin plates has imparted a firmer tone to the market and there are buyers for forward delivery at 22s (\$4.31), basis f.o.b., with option contracts for November-December delivery sold at 21s (\$4.11), basis f.o.b. There is a better export business, including orders from Portugal. The Welsh output is about 55 per cent of capacity, but some makers are rolling for stock. The Montmouthshire Steel Works are selling tin plate bars at £7 (\$27.44) for Welsh makers with the price unaltered.

Galvanized sheets to Japanese specifications have been sold at £27 (4.72c. per lb.), f.o.b., December shipment, and Welsh works have sold black sheets to Japanese specifications at £18 10s for December shipment, but few are now obtainable before January.

Coke prices are falling. Pig iron producers are realizing the necessity to compete for orders. The lower grades have been reduced but there has been few sales. Germany is buying cheap grades of foreign ore.

We quote per gross ton, except where otherwise stated, f.o.b. maker's works, with American equivalent figured at \$3.92 per £1 as follows:

Durham coke, delivered...	£1 10	\$5.88
Cleveland basic	7 7½ & £7 10*	28.90 to \$29.40
Cleveland No. 1 foundry...	7 0	27.44
Cleveland No. 3 foundry...	6 0	23.52
Cleveland No. 4 foundry...	5 14	22.34
Cleveland No. 4 forge.....	5 12½	22.05
Hematite	7 0*	27.44
East Coast mixed.....	6 10 & 6 5*	25.48 & 24.50
Ferromanganese	16 0 & 14 0*	62.72 & 54.88
Rails, 60 lb. and up.....	9 10 to 12 10	37.24 to 49.00
Billets	7 0 to 7 10	27.44 to 29.40
Sheet and tin plate bars, Welsh	8 0 to 8 5	31.36 to 33.32
Tin plate base box.....	1 1 to 1 2½	4.11 to 4.31
		C. per Lb.
Ship plates	10 10	1.83
Boiler plates	16 0	2.80
Tees	11 10	2.01
Channels	10 5 to 10 15	1.78 to 1.88
Beams	10 10	1.75
Round bars, ¾ to 3 in....	12 0	2.10
Galvanized sheets, 24 g....	18 0 to 18 10	3.15 to 3.26
Black sheets	15 0 to 16 0	2.62
Steel hoops	14 5 & 14 0*	2.49 & 2.10
Cold rolled steel strip, 20 g. 24 10		4.24

*Export price.

Pig Iron Still Coming from the Continent—Production Costs Still High

LONDON, England, Oct. 5.—The Government is still engaged in discussing plans for the relief of unemployment and the revival of trade, but so far as the iron and steel trade is concerned, the whole question is one of costs of production. The position was well put by Mr. Hichens, chairman of Cammel, Laird & Co., when addressing the quarterly meeting of the London iron and steel exchange on Tuesday. He urged the reducing of steel prices to the level of that of the continent as the only means of getting business, and to do this, he said, production must be cheapened by gradual reductions in wages. Instead of, as hitherto, an official minimum wage ruling for every specified branch of trade, wages must depend entirely upon the prices which can be obtained for the commodities manufactured and trade union restrictions must be abolished entirely.

In the meantime business still goes to the continent where supplies can be obtained at very much lower prices in spite of the fact that such producers are already getting behind in shipments. British pig iron prices show no change, the ironmasters asserting that they cannot reduce quotations until costs of production are down and consumers refrain from placing business until they can buy at cheaper rates. There are now 18 furnaces blowing in the Cleveland district out of a total number of 72, and of these 9 are working on hematite iron. The demand for this latter iron is, however, improving, buyers having been encouraged to place orders by the recent cuts in prices, and it is anticipated that the end of this month will see still more furnaces operating.

In finished steel, however, business does not expand. In Scotland two large steel works have been forced to close down within the last few days, thus adding to the number of unemployed, while two North Eastern steel works have also ceased operations and practically all the others are only working on part time. The one bright spot in the trade is the sheet market and some fair orders are being taken at current prices, mainly owing to the fact that continental makers cannot give sufficiently early delivery.

Increase in Coal and Coke Production

UNIONTOWN, PA., Oct. 17.—The week just closed has witnessed a still further increase in production of both coal and coke in the Fayette bituminous district. Increased output of coke over the preceding week was approximately 1000 tons. Coal output showed a still more substantial gain. Market quotations continue firm with coke quoted not lower than \$3.50, although one spot sale of considerable magnitude was reported during the week at \$3.30. Foundry coke is quoted at \$4.50 and \$4.75. The week was lacking in any special features.

Prices Finished Iron and Steel, f.o.b. Pittsburgh

Freight Rates

Freight rates from Pittsburgh on finished iron and steel products, in carload lots, to points named, per 100 lb., are as follows:

Philadelphia, domestic..	\$0.35	Kansas City	\$0.815
Philadelphia, export..	0.265	Kansas City (pipe)...	0.77
Baltimore, domestic...	0.335	St. Paul	0.665
Baltimore, export.....	0.255	Omaha	0.815
New York, domestic....	0.38	Omaha (pipe)	0.77
New York, export.....	0.285	Denver	1.35
Boston, domestic	0.415	Denver (wire products)	1.415
Boston, export	0.285	Pacific Coast	1.665
Buffalo	0.295	Pacific Coast, ship plates	1.335
Cleveland	0.24	Birmingham	0.765
Detroit	0.325	Jacksonville, all rail..	0.555
Cincinnati	0.325	Jacksonville, rail and	
Indianapolis	0.345	water	0.46
Chicago	0.38	New Orleans	0.515
St. Louis	0.475		

The minimum carload to most of the foregoing points is 36,000 lb. To Denver the minimum loading is 40,000 lb., while to the Pacific Coast on all iron and steel products, except structural material, the minimum is 80,000 lb. On the latter item the rate applies to a minimum of 50,000 lb., and there is an extra charge of 9c. per 100 lb. on carloads of a minimum of 40,000 lb. On shipments of wrought iron and steel pipe to Kansas City, St. Paul, Omaha and Denver, the minimum carload is 46,000 lb. On iron and steel items not noted above the rates vary somewhat and are given in detail in the regular railroad tariffs.

Rates from Atlantic Coast ports (i.e., New York, Philadelphia and Baltimore) to Pacific Coast ports of call on most steamship lines, via the Panama Canal, are as follows: Pig iron, 55c.; ship plates, 75c.; ingot and muck bars, structural steel, common wire products, including cut or wire nails, spikes and wire hoops, 75c.; sheets and tin plates, 60c. to 75c.; rods, wire rope, cable and strands, \$1; wire fencing, netting and stretcher, 75c.; pipe, not over 8 in. in diameter, 75c.; over 8 in. in diameter, 2½c. per in. or fraction thereof additional. All prices per 100 lb. in carload lots, minimum 40,000 lb.

Structural Material

I-beams, 3 to 15 in.; channels, 3 to 15 in.; angles, 3 to 6 in., on one or both legs, ¼ in. thick and over, and zeos, structural sizes, 1.50c. to 1.65c.

Sheared plates, ¼ in. and heavier, tank quality, 1.50c. to 1.65c.

Wire Products

Wire nails, \$2.90 base per keg; galvanized, 1 in. and longer, including large-head barbed roofing nails, taking an advance over this price of \$1.25 and shorter than 1 in., \$1.75; bright Bessemer and basic wire, \$2.60 per 100 lb.; annealed fence wire, Nos. 6 to 9, \$2.60; galvanized wire, \$3.10; galvanized barbed wire, \$3.55; galvanized fence staples, \$3.55; painted barbed wire, \$3.05; polished fence staples, \$3.05; cement-coated nails, per count keg, \$2.45; these prices being subject to the usual advances for the smaller trade, all f.o.b. Pittsburgh, freight added to point of delivery, terms 60 days, net, less 2 per cent off for cash in 10 days. Discounts on woven-wire fencing are 68 to 70½ per cent off list for carload lots, 67 to 69½ per cent for 1000-rod lots, and 66 to 68½ per cent for small lots, f.o.b. Pittsburgh.

Bolts, Nuts and Rivets

Large structural and ship rivets.....\$2.40 case
Large boiler rivets.....\$2.50 case
Small rivets70, 10 and 5 to 70, 10 and 7½ per cent off list
Machine bolts, small, rolled threads, 70, 10 and 5 per cent off list

Machine bolts, small, cut threads, 70 and 5 per cent off list
Machine bolts, larger and longer, .65, 10 and 5 per cent off list
Carriage bolts, ¾ in. x 6 in.:
Smaller and shorter rolled threads, .65, 10 and 10 per cent off list

Cut threads65 and 10 per cent off list
Longer and larger sizes.....65 and 10 per cent off list
Lag bolts70 and 10 to 70, 10 and 5 per cent off list
Plow bolts, Nos. 1, 2 and 3 heads.....60 and 10 per cent off list
Other style heads20 per cent extra
Machine bolts, c.p.c. and t. nuts, ¾ in. x 4 in.:
Smaller and shorter.....65 and 5 per cent off list
Larger and longer sizes.....65 per cent off list

Hot pressed sq. or hex. blank nuts.....\$5.50 off list
Hot pressed nuts, tapped.....\$5.00 off list
C.p.c. and t. sq. or hex. blank nuts.....\$5.25 off list
C.p.c. and t. sq. or hex. blank nuts, tapped.....\$5.00 off list
Semi-finished hex. nuts:
¼ in. to 9/16 in. inclusive.....80, 10 and 10 per cent off list
Small sizes S. A. E.....80, 10, 10 and 10 per cent off list
¾ in. to 1 in. inclusive, U. S. S. and S. A. E.,
70, 10, 10 and 10 per cent off list

Stove bolts in packages.....80, 10 and 5 per cent off list
Stove bolts in bulk.....80, 10 and 7½ per cent off list
Tire bolts65, 10 and 10 per cent off list
Track bolts, carloads.....3.25c. to 3.50c. base
Track bolts, less than carloads.....4.25c. to 4.50c.

Square and Hex-Head Cap Screws

¼ in. and under.....75 and 10 to 80 and 10 per cent off list
9/16 in. to ¾ in.....75 and 10 to 80 and 10 per cent off list

Set Screws

¼ in. and under.....80, 10 and 5 to 85 per cent off list
9/16 in. to ¾ in.....80, 10 and 5 to 85 per cent off list

Rivets

Rivets, 1c. per lb. extra for less than 200 kegs. Rivets in 100-lb. kegs, 25c. extra to buyers not under contract; small and miscellaneous lots less than two tons, 25c. extra; less than 100 lb. of a size or broken kegs, 50c. extra.

All prices carry standard extras f.o.b. Pittsburgh.

Wire Rods

No. 5 common basic or Bessemer rods to domestic consumers, \$40 to \$41; chain rods, \$40 to \$41; screw stock rods, \$45 to \$46; rivet and bolt rods and other rods of that character, \$40 to \$41; high carbon rods, \$48 to \$53, depending on carbons.

Railroad Spikes and Track Bolts

Railroad spikes, 9/16-in. and larger, \$2.30 to \$2.40 base per 100 lb. in lots of 200 kegs of 200 lb. each or more; spikes, ½-in., ¾-in. and 7/16-in., \$2.50 to \$2.75 base; 5/16-in., \$2.50 to \$2.75 base. Boat and barge spikes, \$2.50 to \$2.75 base per 100 lb. in carload lots of 200 kegs or more, f.o.b. Pittsburgh. Track bolts, \$3.25 to \$3.50 base per 100 lb. Tie plates, \$2 per 100 lb.

Terne Plates

Prices of terne plates are as follows: 8-lb. coating, 200 lb., \$11.30 per package; 8-lb. coating, I. C., \$11.60; 15-lb. coating, I. C., \$14.30; 20-lb. coating, I. C., \$15.55; 25-lb. coating, I. C., \$16.80; 30-lb. coating, I. C., \$17.80; 35-lb. coating, I. C., \$18.80; 40-lb. coating, I. C., \$19.80 per package, all f.o.b. Pittsburgh, freight added to point of delivery.

Iron and Steel Bars

Steel bars, 1.50c. to 1.65c. from mill. Refined bar iron, 2.15c. to 2.25c.

Welded Pipe

The following discounts are to jobbers for carload lots on the Pittsburgh basing card:

Butt Weld			Iron		
Inches	Steel		Inches	Black	Galv.
¼	Black	Galv.	¼ to ¾	3½	+22½
½	54½	28	¾	36½	18½
¾	57½	31	1	42½	27½
1	62½	48	1 to 1½	44½	29½
1½	66½	54			
2	68½	56			

Lap Weld			Lap Weld		
2	61½	49	2	39½	25½
2½	65½	53	2½	42½	29½
3	62½	49	3	40½	27½
3½	61½	48			

Butt Weld, extra strong, plain ends			Lap Weld, extra strong, plain ends		
¼	50½	33	¼ to ¾	+4½	+37½
½	53½	35	¾	35½	23½
¾	59½	48	1	42½	28½
1	64½	53	1 to 1½	44½	30½
1½	66½	55			
2	68½	56			

2	59½	48	2	40½	27½
2½	63½	52	2½	43½	31½
3	62½	51	3	42½	30½
3½	58½	45	3½	35½	23½
4	58½	45	4	30½	18½

To the large jobbing trade the above discounts are increased by one point, with extra discounts of 5 and 2½ per cent.

Boiler Tubes

The following are the discounts for carload lots f.o.b. Pittsburgh:

Lap Welded Steel		Charcoal Iron	
1¼ in.	26½	1½ in.	5
2 to 2¼ in.	41	1¾ to 1½ in.	15
2½ to 3 in.	52	2 to 2¼ in.	25
3¼ to 13 in.	57	2½ to 3 in.	30
		3½ to 4½ in.	32

Standard Commercial Seamless Boiler Tubes

New discounts have been adopted on standard commercial seamless boiler tubes, but manufacturers are not yet ready to announce them for publication, and for that reason we publish no discounts this week.

Sheets

Prices for mill shipments on sheets of standard gage in carloads, f.o.b. Pittsburgh, follow:

Blue Annealed		Box Annealed, One Pass Cold Rolled	
Cents per Lb.		Cents per Lb.	
Nos. 8 and heavier.....2.45		Nos. 13 and 14.....2.60	
Nos. 9 and 10 (base).....2.50		Nos. 15 and 16.....2.70	
Nos. 11 and 12.....2.55			
Cents per Lb.		Cents per Lb.	
Nos. 17 to 21.....2.80		Nos. 28 (base).....3.00	
Nos. 22 to 24.....2.85		No. 29.....3.10	
Nos. 25 and 26.....2.90		No. 30.....3.20	
No. 27.....2.95			

Galvanized

Nos. 10 and 11.....3.00	Nos. 25 and 26.....3.70
Nos. 12 to 14.....3.10	No. 27.....3.85
Nos. 15 and 16.....3.25	No. 28 (base).....4.00
Nos. 17 to 21.....3.40	No. 29.....4.25
Nos. 22 to 24.....3.55	No. 30.....4.50

Tin-Mill Black Plate

Nos. 15 and 16.....2.80	No. 28 (base).....3.00
Nos. 17 to 21.....2.85	No. 29.....3.05
Nos. 22 to 24.....2.90	No. 30.....3.05
Nos. 25 to 27.....2.95	Nos. 30½ and 31.....3.10

NON-FERROUS METALS

The Week's Prices

		Cents Per Pound for Early Delivery					
		Copper, New York		Lead		Zinc	
		Electro-lytic	Tin New York	New York	St. Louis	New York	St. Louis
Oct.	Lake						
11.....	13.00	12.87 1/2	27.15	4.70	4.50	5.10	4.60
13.....	13.00	12.75	27.25	4.70	4.50	5.12 1/2	4.62 1/2
14.....	13.00	12.75	27.37 1/2	4.70	4.50	5.12 1/2	4.62 1/2
15.....	13.00	12.75	.....	4.70	4.50	5.12 1/2	4.62 1/2
17.....	13.00	12.75	28.25	4.70	4.50	5.15	4.65
18.....	13.00	12.75	28.00	4.70	4.50	5.17 1/2	4.67 1/2

New York

NEW YORK, Oct. 17.

Most of the markets turned quiet toward the end of last week and have continued so since. Demand for copper is moderate with prices steady, and the same is true of lead. The tin market has advanced and so has the zinc market, due to conditions distinctly different in each case. Wednesday, Oct. 12, was observed as a holiday in this market.

Copper.—The buying movement in electrolytic copper, which characterized the past two or three weeks, has placed the producers in a firm position and has apparently taken care of a substantial part of the needs of large consumers. At any rate sales and inquiries are less at the present time, but a strong latent demand is reported to exist according to the reports of several large sellers. As soon as something is decided regarding the prospective railroad strike this business is expected to materialize. While quotations for electrolytic copper are a shade less than a week ago, the market may not be considered as weaker. For early or 30-day delivery electrolytic copper can be obtained at 12.75c., New York, or 13c. delivered, although some sellers are asking 1/4c. to 1/2c. more. Moderate sales are being made at these prices both for domestic and foreign account, the latter demand being reported as very good.

Tin.—Sales of Straits tin, both spot and future, continue to be made in moderate amounts. This movement has been the feature of the market for the greater part of six weeks to two months, and in all cases consumers have been liberal buyers. In the past week the market has been quiet with business confined to one or two days. On Oct. 13 there was a good demand for spot Straits tin from consumers and at least 100 tons was sold by one seller at 26.25c., New York. On that day there were also buyers of distant future at 27.62 1/2c. to 27.75c., but no business was done because of a lack of sellers. Some tin, ex-steamer at dock, was also sold at 27.12 1/2c. London houses have been ready buyers of parcels of tin for future delivery and as a result this position has been difficult to purchase. On Oct. 14 at least 150 tons of future shipment Straits tin was sold at 27.75c. to 28c., mostly to consumers. Since then the market has been quiet and largely nominal. Total shipments from the East of Straits metal to all countries for the first half of October are returned as 2235 tons. Spot Straits tin is quoted to-day at 28c., New York. The London market is strong with spot standard quoted at £157 5s, future standard at £159 10s, and spot Straits at £157 15s. Arrivals thus far this month have been 1635 tons with 3500 tons reported afloat.

Lead.—The market continues quiet and firm and characterized by no particular features. A steady business is reported by most sellers. The leading interest continues to quote early delivery metal at 4.70c., New York and St. Louis, but independent sellers are exacting a slight premium upon this price in the New York market. Their St. Louis quotation is 4.50c.

Zinc.—The market for prime Western zinc continues to stiffen and prices are higher. For delivery in 30 days quotations range from 4.67 1/2c. to 4.70c., St. Louis, and 5.17 1/2c. to 5.20c., New York. Business has been done at the lower levels and demand continues good. The strength of the market, however, is due more to the policy of producers to sell only their output, which is limited, and not to draw upon reserve stocks made at

higher levels. An interesting inquiry is one for about 3000 tons of brass special zinc, delivery to be spread over a considerable period.

Antimony.—Wholesale lots for early delivery are quoted at 5c., New York, duty paid, but it is possible that this could be shaded.

Aluminum.—The leading American producer continues to quote 24.50c. per lb. f.o.b. plant, for the virgin metal, but the same grade from importers is obtainable as low as 17c. to 18c., New York, duty paid.

Old Metals.—The activity of the past few weeks has stopped and the market has settled down to a quiet basis awaiting the result of the railway strike situation. Dealers' selling prices are nominally as follows:

	Cents Per Lb.
Copper, heavy and crucible.....	\$12.25
Copper, heavy and wire.....	11.25
Copper, light and bottoms.....	9.50
Heavy machine composition.....	9.75
Brass, heavy.....	7.00
Brass, light.....	5.50
No. 1 red brass or composition turnings.....	7.75
No. 1 yellow rod brass turnings.....	5.50
Lead, heavy.....	4.00
Lead, tea.....	3.00
Zinc.....	3.00

Chicago

Chicago, Oct. 19.—Price tendencies are mixed, copper and lead having declined slightly and tin and spelter having advanced. The recession in copper is regarded as the forerunner of rather a substantial recovery, as considerable business is in prospect. Zinc and tin have been fairly active, while lead is very quiet. Old metal prices are unchanged. We quote in carload lots: Lake copper, 13c. to 13.25c.; tin, 29.00c.; lead, 4.60c.; spelter, 4.75c.; antimony, 7c., in less than carload lots. On old metals we quote: Copper wire, crucible shapes and copper clips, 8.50c.; copper bottoms, 7c.; red brass, 7c.; yellow brass, 5c.; lead pipe, 3c.; zinc, 2.25c.; pewter, No. 1, 17c.; tin foil, 18c.; block tin, 20c.; all buying prices for less than carload lots.

St. Louis

St. Louis, Oct. 18.—The lead market is steady, but slightly lower at 4.47 1/2c. carlots, while slab zinc is quiet and slightly higher at 4.62 1/2c. We quote Lake Copper at 13.73 1/2c. to 13.74c., carlots; tin, 28.11c., and antimony, 5.73 1/2c. to 5.74c. In old metals, we quote: light brass, 3.50c.; heavy red brass, 7c.; light copper, 7c.; heavy yellow brass, 4c.; heavy copper and copper wire, 7.50c.; zinc, 2c.; pewter, 15c.; tin foil, 16c.; tea lead, 2c.; aluminum, 9c.

Marked Improvement in Fabricated Steel

The volume of business done in fabricated structural steel work in September totaled about 86,000 tons, according to the records collected by George E. Gifford, secretary Bridge Builders and Structural Society, New York. This compares with 59,300 tons in August and is the largest month's total since June and July of 1920, when slightly over 90,000 tons was put under contract in each of these months. The September business corresponds to about 48 per cent of the capacity of the bridge and structural shops of the country.

The volume of business for the nine months of the year makes a total of 489,000 tons, which represents 30 per cent of the theoretical capacity of the fabricating trade. The leanest two years of the last ten, 1913 and 1914, had a total of 1,078,000 tons each. For 1921 to approach these lean years in total volume would require a rate of contracting in the third quarter of this year of over 100 per cent of the capacity of the shops.

Coke Rate Reduced

WASHINGTON, Oct. 18.—Effective last Friday, the Philadelphia & Reading and the Pennsylvania railroads have filed tariffs with the Interstate Commerce Commission reducing the rate on by-product coke from Swedeland, Pa., to Philadelphia and intermediate points from \$1.26 to \$1.12 per gross ton.

PERSONAL

L. J. Hoy, for several years with the Eastern Machinery & Equipment Co., Philadelphia, as sales manager, has severed his connection with that company and has been appointed manager of the used machinery department of Sherritt & Stoer Co., 2006-2008 Market Street, Philadelphia. Mr. Hoy has been connected with the used machinery business in New York, Cleveland and Philadelphia.

Joseph Michaels, vice-president Hyman-Michaels Co., Chicago, has returned from a four months' tour of England, France, Germany and other European countries.

Lyle W. Orr, for the past 10 years general manager of Modern Tool Co., Erie, Pa., has resigned. He has no immediate plans.

Frank W. Trabold, 30 Church Street, New York, after 20 years with J. H. Williams & Co., has severed his connection with the company of which he has been vice-president. Since 1909 he has been successively sales manager, works manager, general manager and vice-president and general manager.

Announcement has been made by the Bureau of Foreign and Domestic Commerce of the arrival of Walter S. Tower, formerly in charge of the iron and steel division, in London, where he took charge of the office this week as commercial attaché. Alfred P. Dennis, whom Mr. Tower succeeded, has been assigned as a special representative of the Department of Commerce to undertake an investigation of agricultural products in Europe. Mr. Tower has been succeeded by Luther Becker as chief of the iron and steel division.

Frank S. Spencer, 1265 Boylston Street, Boston, has been appointed New England sales agent of the Marf Machine & Die Casting Co., Brooklyn, the Peerless Drawn Steel Co., Massillon, Ohio; Topping Brothers, New York; the Witherow Steel Co., Pittsburgh.

William K. Bixby, who will spend the winter in India and South America, has resigned from the board of directors of the Wagner Electric Mfg. Co., St. Louis, and has been succeeded by James M. Buick, vice-president and general manager of the American Car & Foundry Co. Walter W. Smith, vice-president of the First National Bank, St. Louis, has succeeded E. A. Potter, Jr., vice-president of the Guaranty Co. of New York on the Wagner board.

Chester E. Sinclair, who has been with the Betz-Pierce Co., Cleveland, jobber in iron and steel, since the organization of that company, and for several years a city salesman for the company in Cleveland, has tendered his resignation, to become effective Nov. 1, and will organize a sales company for handling the washing machine equipment in Cleveland and vicinity of the Laundrette Mfg. Co., Cleveland.

William M. Sweet, a director and vice-president Klaxon Co., has relinquished his duties with the General Motors Corporation to devote his entire time to the Klaxon interests. Mr. Sweet is also a vice-president, director and member of the executive committee of the Bearings Service Co., Detroit.

William C. Wolfe has been appointed manager of sales of the Highland Iron & Steel Co., Terre Haute, Ind., with headquarters at 208 South La Salle Street, Chicago.

C. C. Boyden, who has been in charge of pig iron sales in the general sales department of the Alan Wood Iron & Steel Co., Philadelphia, has resigned. Mr. Boyden was for many years with B. Nicoll & Co., 149 Broadway, New York, pig iron merchants.

Louis J. Campbell, president Electric Alloy Steel Co., Youngstown, Ohio, and son of President James A. Campbell of the Youngstown Sheet & Tube Co., is recovering from a serious attack of pneumonia.

Gerald H. Moses, since July, 1917, in charge of the Pittsburgh office of Oliver Bros., Inc., Peoples Bank Building, has resigned, to become general purchasing

agent of the American Window Glass Co., Pittsburgh. Mr. Moses will be succeeded by Oliver A. Lanchantin, who has been manager of the New York office of Oliver Bros., Inc.

Frank P. Jones, has been appointed president of the Canada Cement Co., Montreal. He has been with the Canada Cement Co. since the beginning of 1910, as general manager, later being made a director and still later a vice-president. He was previously associated with the Dominion Iron & Steel Co., starting as sales manager and rising to be general sales agent, and from 1905 to 1910, general manager. Besides his connections with the Cement company, Mr. Jones is president of the Consumers Gas Co., director of the Canadian Bank of Commerce, Montreal Trust Co., and the Ontario Steel Products Co.

G. V. Ziv, formerly manager of the Chicago branch of A. Milne & Co., announces that he has entered business for himself as president and treasurer of the Ziv Steel & Wire Co., 4423 West Kinzie Street, Chicago. The new company will handle tool steel and solid drill and hollow drill steel. Norman J. Hyslip is general sales manager.

S. E. Eby, for several years with the American Steel Foundries as master mechanic and later as works engineer, recently became sales manager of the Lutz Co., Philadelphia, manufacturer of machinery, tools and special machine work.

Sidney G. Down, for 10 years Pacific district manager, Westinghouse Air Brake Co., and president Westinghouse Pacific Coast Brake Co., with headquarters in San Francisco, has been appointed general sales manager of the company, with offices in Wilmerding, Pa. Mr. Down has been with the company for about 20 years and previously had been airbrake inspector and instructor for the Michigan Central Railroad.

W. H. Snedaker, formerly in the Tacoma, Wash., office of the Griffin Wheel Co., Chicago, has been appointed manager of the sales office established by the company in the Rialto Building, San Francisco.

E. F. S. Mattice, B.A.Sc., M.E.T.C., has been appointed manager of the Phoenix Bridge & Iron Works, Ltd., Montreal. Mr. Mattice is a graduate in the Faculty of Applied Science, McGill University, and for most of his professional career has been with the Dominion Bridge Co., latterly as its general contracting engineer. He was for several years president of the Structural Engineering Co., and has supervised the steel design of many of the largest buildings in Canada.

Prof. John H. Nelson, Wyman & Gordon Co., Worcester, Mass., was the principal speaker at the meeting of the Hartford Steel Treating Society, Thursday, Oct. 13, at Jewell Hall in the Y. M. C. A., Hartford, Conn. Professor Nelson's subject was the drop forging and heat treatment of steel, on which he is a widely recognized authority. There was a large attendance.

Charles H. Chubbuck, chief engineer McClintic-Marshall Co., who recently returned from China where he was identified with bridge and other construction work, was scheduled to address the Engineers' Club of Philadelphia at a luncheon meeting on Oct. 18.

M. A. Green, for ten years superintendent of branches and agencies of the Crucible Steel Co. of America, has become associated with John Hy Andrew & Co., Ltd., Sheffield, England, as manager of its tool steel department at 26 Cortlandt Street, New York.

Jacob M. Schaefer, formerly secretary of the Michigan Smelting & Refining Co., Detroit, has been elected president of the Wolverine Storage Co., Detroit, recently organized with a capital of \$500,000.

George L. Sawyer, formerly sales manager of material handling machinery for Barber-Greene Co., Aurora, Ill., has been appointed to represent Universal Crane Co., Elyria, Ohio, in the New York field in the sale of cranes. His offices are at Allied Machinery Center, 141 Center Street, New York.

B. Stevenson, formerly superintendent for the Winston Co., Cleveland, has joined the King Motor Car Co., Detroit, as factory manager.

M. T. Conklin, Detroit, has been elected president of the Gale Mfg. Co., Albion, Mich., engaged in the

foundry business. H. L. Stanton, Detroit, has been elected secretary. Other officers elected were vice-president and treasurer, L. E. White, Albion, and assistant secretary and factory manager, W. C. Sackett, Albion.

Frederick Best, a director of Thos. Firth & Sons, Ltd., Sheffield, England, arrived on the Adriatic and will spend a few weeks on a business trip in this country, and in connection with the new sales arrangements for Firths. He is accompanied by his son, F. Arnold Best.

Charles F. Hauss left New York Oct. 16 to go to China, where he will represent the American Radiator Co. in a territory which comprises China, Japan, Manchuria and Korea. Latterly he has been identified with the exporting and importing business, largely with Italian connections, and previous to that was located in Milan. For a considerable number of years he was connected with the American Radiator Co., largely in France and Italy. His professional and commercial career has been largely linked with the heating business, beginning first in the United States. For the time being his headquarters will be care of the American consul, Shanghai.

M. A. Green, for ten years superintendent of branches and agencies of the Crucible Steel Co. of America, has become associated with the Newman-Andrew Co., 26 Cortlandt Street, New York, as manager of its tool steel department. The Newman-Andrew Co. is the United States end of Jno. Hy. Andrew & Co., Ltd., the Toledo Steel Works, Sheffield, England. Mr. Green has been identified with the tool steel business for a period of some twenty years.

O. K. Davis, secretary National Foreign Trade Council, New York, returned recently from a South American trip. He was the appointee of the Postoffice Department at Washington to represent the United States in the International Postal Congress held recently at Buenos Aires.

F. E. Neitzel, superintendent of construction at the Alameda plant of the Bethlehem Shipbuilding Corporation, returned to San Francisco recently from a five months' tour in Europe, during which he visited various plants in England, Scotland, France, Switzerland, Germany, Italy and Denmark in which Diesel engines are manufactured. It is expected that Diesel engines will be a considerable part of the output of the Alameda shops and both stationary and marine types will be manufactured.

Dr. Walter E. Boveri, of the well-known Swiss electrical engineering firm of Brown, Boveri & Cie., arrived in New York on Oct. 7 and will make his headquarters with the Scintilla Magneto Co., 225 West Fifty-seventh Street, New York.

Charles R. Hook, vice-president American Rolling Mill Co., Middletown, Ohio, will make an address at the annual meeting of the Academy of Political Science at the Hotel Astor, New York, Nov. 4, on "Winning the Confidence of Employees by Taking the Mystery Out of Business." Harold A. Hatch, of Deering, Milliken & Co., New York, will speak on "Insurance Against Unemployment in a Plant."

Dr. Henry M. Howe, Bedford Hills, N. Y., has been confined to his room for a number of weeks by illness.

Maurice de Wendel, of the famous French firm of de Wendel & Co., which has 16 blast furnaces and a basic Bessemer steel plant in Lorraine and eight blast furnaces and a steel plant in eastern France, is making a tour of the iron and steel centers of the United States.

J. L. Neely, for the past eight years assistant traffic manager American Sheet & Tin Plate Co., has been promoted to the position of traffic manager, in place of the late Andrew G. Young. Mr. Neely has been in the traffic department, American Sheet & Tin Plate Co., for the past 20 years.

W. Vernon Phillips, president F. R. Phillips & Sons Co., steel exporters, and the Ettenger-Phillips Co., railroad construction and engineering, Pennsylvania Building, Philadelphia, accompanied by George W. Ettenger, vice-president of the latter company, will sail Oct. 27 for Rio de Janeiro on business.

OBITUARY

DR. JOSEPH W. RICHARDS, professor of metallurgy at Lehigh University, Bethlehem, Pa., died suddenly of heart disease at his home in Bethlehem on Oct. 13.



DR. JOSEPH W. RICHARDS

Dr. Richards was born in Oldbury, England, 57 years ago and came to the United States in his very early youth. He went to Lehigh University as a student after being graduated from the Central High School in Philadelphia. Later he became a professor at Lehigh, ultimately occupying the chair of metallurgy. He was a teacher in the university for over 30 years. Professor Richards was recognized as one of the foremost chemical engineers and metallurgists of the country and he enjoyed an international reputation. He was regarded

as particularly an authority on aluminum and wrote extensively on this and other technical subjects. He was the representative of the Franklin Institute, Philadelphia, at the International Geological Congress in Russia in 1897 and two years later he was one of the judges of the department of chemistry at the National Export Exhibition in Philadelphia, serving also in a similar capacity at the Panama-Pacific Exposition in 1915. During the last three years of the war, he was a member of the United States Naval Consulting Board. In 1902, when the American Electrochemical Society was formed, he was active in its organization and became its first president. At his death, he was secretary of this society, which office he had held for several years. He was also a member of the American Institute of Mining and Metallurgical Engineers in whose activities he was always prominent; he was an honorary member of the American Society for Steel Treating and a member of other technical organizations.

ROBERT LAWRENCE AHLES, president Sweet's Steel Co., Williamsport, Pa., died at Westbury, L. I., Oct.



ROBERT LAWRENCE AHLES

17. He was 43 years old, the son of the late Mr. and Mrs. John William Ahles, formerly of Bayside, L. I. He has been for many years active and prominent in the iron and steel industry of this country, at the time of his death being president of the Sweet's Steel Co. He was formerly identified with the Hewitt interests in northern New Jersey in the operation of blast furnaces. Mr. Ahles was married in 1902 to Helen Kemper, of Virginia. He is survived by Mrs. Ahles and one daughter, Lydia Bell, 12 years old. During the late war Mr. Ahles was in France many months in connection with Red Cross work. At the time of his death he was a member of the Union, Racquet and Tennis, Turf and Field, and Engineers Clubs, New York, and a director of the Trust Co. of New Jersey, Hoboken, and West Branch National Bank, Williamsport, Pa. His illness was comparatively brief. He divided his time between the New York office at 2 Rector Street and that at Williamsport. His home was at the latter place. He was a member of the American Iron and Steel Institute.

GERMAN MOOD SPECULATIVE

Mills Without Stocks Operate at Capacity— Warehouses and Speculators Force Prices Up—Buying Heavy

(Special Correspondence)*

BERLIN, GERMANY, Oct. 4.—Heavy fluctuations in foreign exchange and the possibility of a recovery of the mark caused jobbers to move cautiously during the past week. With still further depreciation of the mark, however, heavy buying set in again, clearly reflecting the speculative character of the present demand. As mills are operating to capacity, extended terms of delivery are being stipulated if orders are accepted at all. A number of mills are discontinuing sales temporarily. It is indicative of present conditions that, while mills have practically no stocks to offer and the scarcity in some lines is acute, there is no real shortage of materials, strikingly revealed by the fairly large offerings of warehouses and speculators. Hoarding and profiteering are much deprecated by the legitimate trade but it is difficult to stop this practice and a demand for introducing restrictive and controlling legislation would probably find but weak support.

In the pig iron market, since the renewed decline of the mark, prices for Saar and Luxemburg irons are higher, holding at about 1600 m. per ton. Quotations for German pig iron are unchanged with demand particularly by the small works, active in anticipation of an official price increase by Nov. 1. The Association of German Malleable Iron Foundries has advanced prices by 140 m. per 100 kg. Conditions in Upper Silesia are steadily improving but blast furnaces are rather slow in returning to production as in certain quarters only short life is predicted for the present boom.

Pending further developments only a few of the 15 furnaces, idle at present, will be blown in. It is noted that England is again appearing as a buyer of Silesian pig iron, and is also showing an interest in finished material.

The quiet tone in semi-finished material during the

*Aerial mail service from Berlin to London discontinued from Oct. 1 until spring of 1922.

New Ore Tariffs Filed

WASHINGTON, Oct. 18.—Tariffs reducing rates on iron ore in official classification territory by 28 per cent were filed yesterday with the Interstate Commerce Commission. The reduction on the more important lines, particularly as it affects ex-lake rates, became operative today, while on a number of lines it does not become effective until Thursday of the present week. On some of the larger lines, however, both dates are applied for different sections, an instance of which is the Baltimore & Ohio. It has named Oct. 18 as the effective date for shipments from the Lake Erie ports and Oct. 20 from other areas on its lines. This is said to be due to the fact that it never had time to make the change as it applies to the latter points after it had been determined to move the date up to Oct. 18.

New Member of Commission and the Pittsburgh Plus Case

WASHINGTON, Oct. 18.—The iron and steel trade is interested in the nomination of Attorney George W. Upham, Warren, Ohio, as a member of the Federal Trade Commission, chiefly because he may be the deciding factor as to the attitude of the commission toward the so-called Pittsburgh case. The present four members of the commission were evenly divided as to the issuance of a complaint which was made possible by the vote of John Garland Pollard, whom Mr. Upham will succeed after confirmation by the Senate. Mr. Upham was formerly secretary and treasurer of the Redifor Rod & Reel Co., Warren. His nomination was a surprise, for it is known that Judge Vernon Van Fleet, of Indiana, now associated with the Department

past fortnight seems to have been caused by overstocks of both jobbers and consumers at the beginning of the present buying period. In sympathy with the general upward tendency of other prices, however, quotations showed slight advances toward the end of the week, billets, basic, and sheet bars being quoted at 2300 to 2400 m. per ton.

A feature of the finished material market is the improved conditions in sheets. The strikes in the Siegerland district having been settled, mills are once more operating at capacity. Heavy sheets are one of the few items on which mills offer early delivery, but the scarcity of light plates is still unrelieved. Wire rods are somewhat softer with average quotations around 3000 m. Rails for mines have been in good demand but only limited tonnages are available. The pipe and tube market is quieter with demand centered chiefly on boiler tubes.

The advance of prices during recent weeks has naturally reacted on the manufacturing industry. Announcements of increases and additions to base prices by the various syndicates and associations are of almost daily occurrence, the new prices frequently becoming obsolete before customers have noted a change. The latest list of price increases includes car springs, bolts and nuts, and enamel ware.

During the past week, the following average prices prevailed per metric ton:

	Marks
Bar iron	3,250
Structural shapes	3,000
Beams	2,900
Tees and channels	2,700
Squares and rounds	2,900
Flats and angles	2,950
Concrete bars	3,100
Hoops	3,300
Wire rods	3,000
Rails	2,950
Rails for mines	2,650
Sheets, heavy	2,700
Sheets, medium	3,100
Sheets, black	4,000
Sheets, planished	5,000
Plates, light	3,900
Wire nails, per 100 kg.	475

The following are the prices of a large Rhenish tin plate works:

Boxes of 112 plates:	Marks
No. 35 U. S. standard gage.....	704.60
No. 33 gage.....	766.50
No. 31 gage.....	859.05

of Justice, had been determined upon as a member of the Federal Trade Commission. It is reported, however, that Judge Van Fleet will continue with the Department of Justice. There are also reports that the work of the Federal Trade Commission is to be transferred, when Government departments are reorganized, to the Department of Justice and that the commission as a body will be abolished. While this report cannot be verified, it has created considerable interest.

Decrease Demand for Steel for Automobile Industry

PITTSBURGH, Oct. 18.—The demand for steel from the automotive industry is on such a moderate scale as to lend support to the assertion that the industry is at least at a temporary saturation point. A prominent steel man, whose business is largely with the automobile makers, subscribes to this idea, although he looks for the industry to make a good recovery. He does not expect the general automotive demand for steel to reach the heavy tonnage in the coming year it did during 1919 and 1920. This man, who is a close student of conditions, says that the buying power of the people of the country has had such a serious contraction in the past year that to all intents and purposes the saturation point has been reached. With more employment which must follow better business, there must come a rise in earning and buying power and hence more people who can afford an automobile. What probably will make for a lighter consumption of steel, he says, is the fact that the demand for the next year at least will be for a light car which will be possible of economical operation. The lighter the car, of course, the less steel will be required.

JAPAN ONLY ACTIVE MARKET

Leading Purchases Black Sheets and Tin Plate —Chinese Inquiries—Galvanized Channels for South Africa

NEW YORK, Oct. 18.—Export trade continues to show improvement, but largely because of the activity of the Japanese market. Other world markets point to little change from the dullness that has prevailed for many months. Japan, however, is reported to have reduced to a considerable extent the heavy stocks of canceled material, acquired through speculation, and in addition is buying at a rate approaching normal. Orders for black sheets of light gages continue to lead, but business in oil can sizes of tin plate has also been large during the past two months.

In August one American exporter booked a total of 20,000 boxes, of which one order was for 12,000 boxes, in September slightly less and in two weeks of October one order for 1000 boxes. In black sheets exporters list heavy orders during the past two months. One house reports a total of about 4000 tons, while another is reported to have accepted a total tonnage of about 8000 tons for shipment to Japanese purchasers. Practically all of these sheets are purchased to be galvanized in the Japanese galvanizing plants erected during the war, but so heavy has been the demands on these plants that in a few instances orders are coming through to American exporters for galvanized sheets, purchasers evidently being unable to obtain sufficiently early delivery from their own plants. The continued excessive buying of sheets has led to the impression that speculation is again rife in Japan, but all reports from agents there state that the financial situation is essentially sound.

Considerable buying is being done for the hydro-electric projects and power houses being established in Japan, and there is fair activity noted in purchases of light rails in addition to the recent purchases and new inquiries for heavy rails made by the Imperial Government Railways. One exporter in New York dealing in both American and German material to the Far East reports the sale of about 2000 tons of 30-lb. and 60-lb. rails of German origin to Japanese industrial enterprises. A large portion of the present plate and bar purchases of Japan are reported being placed in Germany and other Continental countries. German quotations, delivered in Japan, however, are reported increasing, bars recently having risen to 128 yen (about \$70) per ton.

Chinese buying is less active at present. Inquiries are being issued by the Universal Steel Export Co., 26 Cortlandt Street, New York, which received the contract from the Chinese Government for 37 locomotives and 400 steel cars. The locomotives, it is stated, will probably be placed with the Baldwin Locomotive Works and the cars may go to an independent car builder. Some independent car builders have submitted quotations based on American constructed steel cars equipped with Belgian wheels and axles, the use of foreign material in this respect having reduced their quotations by about \$150 per car.

Despite difficulties of trade with Mexico, a New York exporter has booked an order for 200 tons of T rails for a trolley line at a west coast port. An inquiry for a South African railroad electrification project has appeared in the American market through London, calling for 3000 pieces of galvanized channels about 36 in. long for cross arms on telegraph poles. This order is reported to have been rejected by British makers because of the galvanizing specification.

Imports of foreign foundry iron for Eastern United States consumers are at present not profitable, as the Belgian pig iron market recently developed an upward trend in prices, at about the same time prices increased slightly in the United States. This led to a Belgian seller in New York refusing to quote on a fair-sized inquiry for foundry iron and rejecting a 1500 ton order for a consumer in the vicinity of Philadelphia. At the new prices in Belgium, representing about a \$2 per ton increase, he was forced to quote \$19.50 to \$20 per ton

c.i.f., port, which was too high to interest American consumers.

German Briquetting Plant for Australia

The Zeitzer Eisengiesserei & Maschinenfabrik Aktien Gesellschaft (Zeitz Iron Foundries & Engineering Works, at Zeitz) has secured an order for a lignite briquetting plant for the State of Victoria. Part of the plant is to be erected at Morwell, about 100 miles east of Melbourne, where there are rich lignite deposits. This order, which is valued at 30,000,000 m., probably represents the first big post-bellum transaction between Australia and German industry.

Cost Association Conference in Pittsburgh

Below is the program of the second national cost conference which the Industrial Cost Association is to hold on Nov. 2, 3 and 4 at the William Penn Hotel, Pittsburgh.

Wednesday, Nov. 2.

- 10:30 a.m.—Address by Horace S. Peck, comptroller S-K-F Industries, Inc., New York, and national president Industrial Cost Association.
- 2:15 p.m.—"What the Sales Manager Should Have from the Accounting Department," by S. B. Taylor, general sales manager S-K-F Industries, Inc., New York.
- 4:15 p.m.—"Inventories: Methods of Completing the Physical Count," by E. C. Grimley, Victor Talking Machine Co., Camden, N. J. Discussion led by Christopher Haigh, supervisor of costs, General Electric Co., West Lynn, Mass.
- 8:00 p.m.—"Responsibility of the Comptroller or Accountant in Times of Business Depression," by F. S. Willett, comptroller Dodge Mfg. Co., Mishawaka, Ind. Discussion led by F. C. Poag, analyst Allied Chemical & Dye Corporation, New York.
- 9:30 p.m.—"Idleness and Its Relation to Industry, in Retrospect," by T. W. Dinlocker, assistant comptroller S-K-F Industries, Inc., New York, and A. W. Wainwright, works auditor Skayef Ball Bearing Co., Hartford, Conn.

Thursday, Nov. 3.

- 9:00 a.m.—"Terminology," by Addison Boren, Yale & Towne Mfg. Co., Stamford, Conn., chairman national terminology committee, Industrial Cost Association.
- 10:00 a.m.—"Budgeting the Plant and Office," by H. S. Breitenstein, chief accountant, bureau of accounting revision, department of controller, Pittsburgh. Discussion led by Weston J. Hibbs, treasurer U. G. I. Contracting Co., Philadelphia.
- 2:00 p.m.—"Sanitation and Safety," by J. B. Ayres, sanitation and safety engineer, National Tube Co., McKeesport, Pa.
- "Cost and Profits of Welfare, Sanitation and Safety," by Major William Hogg, assistant to vice-president National Tube Co., Pittsburgh.
- 7:00 p.m.—Informal banquet, President Peck, toastmaster.
- "Looking into the Future," by Newcomb Carlton, president Western Union Telegraph Co., New York.
- "Federal Taxation," by Sanford Robinson, New York.

Friday, Nov. 4.

- 9:00 a.m.—"How Can a Cost System, Although Efficient, Demoralize an Organization," by J. M. Howell, supervisor of costs General Electric Co., Schenectady, N. Y. Discussion led by Ernest J. Wessen, cost engineer W. T. Rawleigh Co., Freeport, Ill.
- 10:30 a.m.—Reports of committees on "Distribution of Burden in Abnormal Times," "Trade Association Uniform Cost Systems," etc.
- 2:00 p.m.—Plant visits.

Invitation to attend is extended to executives and department heads of industrial plants, and those interested are asked to notify the national secretary, A. A. Alles, Jr., 2828 Smallman Street, Pittsburgh.

The general chairman of committees having the conference in charge is James P. McLean, Pittsburgh Forge & Iron Co., Pittsburgh. The chairmen of the various sub-committees are as follows: Hotel reservations, Jay Chapin, James H. Matthews & Co., Pittsburgh; railroad reservations, George W. Sheridan, West Leechburg Steel Co., Pittsburgh; credentials, E. R. Brown, National Tube Co., Pittsburgh; registration, A. W. Conley, Armstrong Cork Co., Oakdale, Pa.; acquaintance, Evan L. Moberg, Vanadium Alloy Steel Co., Latrobe, Pa.; entertainment, A. W. Bendig, Mackintosh-Hemphill Co., Pittsburgh; plant visits, Morgan B. Schiller, American Foundry & Construction Co., Pittsburgh; publicity, F. L. Dudgeon, Standard Underground Cable Co., Pittsburgh; exhibits, T. L. Maurado, Macbeth-Evans Glass Co., Pittsburgh.

The War Department received 3.125c. per lb., f.o.b. cars, New Cumberland, Pa., for 255 net tons of miscellaneous lots and sizes of tin plate which were sold at auction at that place on Oct. 6. The material, which was of prime quality, was distributed among several buyers.

Machinery Markets and News of the Works

ANOTHER RAILROAD LIST

Missouri, Kansas & Texas Inquires for 75 Machines at St. Louis

Camden, N. J., Schools Buy 40 Machines— New York School List of 100 Tools Will Be Out Soon

Prospects of important railroad buying of machine tools and other shop equipment grow more promising, the latest development of interest being the issuance of a list of 75 wanted by the Missouri, Kansas & Texas Railroad from its purchasing department in St. Louis. The complete list is published under the St. Louis heading. Favorable action is expected on the list of about 40 machines inquired for two weeks ago by the Delaware, Lackawanna & Western Railroad. The New York Central is expected to issue a list soon covering its 1922 requirements and other roads are also on the point of entering the market, though the prospective railroad strike may cause temporary postponements.

Of minor importance but indicating the more widespread interest by railroads in new shop equipment are inquiries from the Chicago & Northwestern, for a few tools and from the Santa Fe, which has added two

or three more tools to its recent inquiries, while the Illinois Central is reported at Chicago to be considering the purchase of additional tools. The Erie Railroad will soon come into the New York market for replacement of machines destroyed by fire in its roundhouse in New Jersey. The Chesapeake & Ohio is expected to close shortly for three tools.

About 40 miscellaneous tools have been purchased for the manual training departments of Camden, N. J., schools, the largest single order being for 15 Flather lathes. The business was split up among several Philadelphia dealers. The New York Board of Education will issue a list probably this week for about 100 tools for seven vocational training schools and the Brooklyn schools will advertise for bids soon on 50 to 70 machines.

Altogether there is a good deal of inquiry before the machine-tool trade, but there is very little, if any, improvement in the volume of orders. In the past week, some tool builders and dealers have experienced a better demand for single machines and a few lists from industrial plants are being figured upon. The Adams Axle Co., Findlay, Ohio, has a fairly good-sized inquiry out for manufacturing axles for Durant motor cars. The Inland Steel Co., Chicago, will buy a number of rail drills and other equipment required in connection with new rail mills to be installed. A Mexican dealer has placed orders at Chicago, including one for 20 South Bend lathes.

New York

NEW YORK, Oct. 18.

There is very little, if any improvement, in machine-tool trade in this market, though the inquiry for 40 tools by the Delaware, Lackawanna & Western Railroad, mentioned last week, has created an expectation that railroad buying may become more of a factor during the next few months than had generally been expected. It is believed that some, if not all, of these machines will be bought soon. The road's inquiry stated frankly that the purchases would be made if prices were favorable. The Erie Railroad is in need of new equipment for a roundhouse in New Jersey recently destroyed by fire and its formal inquiry is said to be in preparation, but may not be issued for a month or two.

School business continues to look promising. The list of the New York City board of education, asking bids on about 100 metal working and woodworking machines for seven vocational training schools, will be sent out within a week or 10 days and the Brooklyn schools will soon ask bids on 50 or 60 tools for manual training departments in that borough. The Camden, N. J., schools have bought the tools for which they recently inquired. One purchase was 15 Flather lathes.

The New York City fire department is advertising for a boring mill and lathe, bids closing Oct. 21.

Activity in this district in inquiries and orders for electric overhead and locomotive cranes is livelier. An inquiry recently issued by the Kelric Co., Inc., 165 Broadway, New York, for a 2-ton or 4-ton electric crane for export, to be used in handling lumber, contained insufficient information for bidding and the foreign purchaser has been asked to forward further details. The Levant-American Co., New York, has changed its inquiry for a 3-ton crane for export to hand power specifications. The American Car & Foundry Co., which purchased a 5-ton overhead traveling crane from the Shepard Electric Crane & Hoist Co., will close shortly on two 5-ton, 47-ft. and 60-ft. span electric cranes. The East Jersey Pipe Co., 7 Dey Street, New York, mentioned as being

in the market for electric cranes in THE IRON AGE, Oct. 13, has asked for five 3-ton, 60-ft. span and three 10-ton cranes with alternate on a 15-ton, all second-hand. Starr & Ansell, 50 Church Street, New York, have requested bids on a 10,000-lb. electric hoist for Japan, speed of 420 ft. per minute, equipped for a 150-hp. motor, but without the motor. Moore & Moore, Reading, Pa., are in the market for a 40-ton and a 15-ton locomotive crane for export. An export inquiry being handled by several exporters, among them Okura & Co., 30 Church Street, New York, calls for a 15-ton, 30-ft. boom locomotive crane.

Among recent sales are: Shepard Electric Crane & Hoist Co., a 5-ton, 43-ft. 6-in. span overhead traveling crane to the Endicott-Johnson Shoe Co., Endicott, N. Y.; 17 1-ton and one ½-ton electric hoists to the Baltimore Car & Foundry Co., Baltimore, Md., and a 5-ton, 85-ft. span overhead traveling crane to the American Car & Foundry Co. for Buffalo; Industrial Works, a 20-ton, 50-ft. boom locomotive crane to Perry, Buxton & Doane, Modena, Pa., iron and steel scrap; Niles-Bement-Pond Co., a 15-ton, 28-ft. span, 1-motor, overhead traveling crane to the Power Construction Co., Worcester, Mass., for plant at Mountain Mills, Vt.; Alfred Box & Co., a 10-ton, 45-ft. span hand power crane to Thomas F. Kelly, 251 Green Street, Brooklyn, N. Y.

The Standard Oil Co. of New Jersey, 26 Broadway, New York, has arranged an appropriation of \$2,000,000 for extensions and improvements at its oil refineries at Bayonne, Jersey City and Elizabeth. New equipment will be installed and about 5000 men will be employed.

The American Gauge Co., New York, has been incorporated at \$100,000 by J. F. Harwood, A. Destamps and J. J. Lawrence, 3 East Forty-fourth Street, to manufacture gages, tools, etc.

The Selso Co., Ogdensburg, N. Y., has been incorporated at \$50,000 by H. J. Parker, M. H. Stevenson and R. C. Sanford, all of Ogdensburg, to manufacture electrically-operated water heaters and parts.

The Adirondack Power & Light Corporation, Amsterdam, N. Y., has made application to the Public Service Commis-

sign for permission to build an addition to its electric power plant at Princeton, Schenectady County.

The Eastern Signal & Supply Co., 50 Church Street, New York, has filed notice of dissolution.

The Unity Utilities Corporation, New York, has been incorporated at \$100,000 by H. A. Jacobson, W. B. Sorrelle and L. J. Annen to manufacture rubber products. The company is represented by H. P. Freese, 27 William Street.

The State Hospital Commission, Capitol Building, Albany, N. Y., will soon take bids for the erection of a new two-story cold storage plant at the Marcy Division State Hospital, Utica, N. Y., 70 x 110 ft., estimated to cost about \$130,000. L. F. Pilcher, Capitol Building, is architect.

The W. A. Crook & Brothers Co. has filed notice of incorporation under New Jersey laws, with capital of \$100,000, to operate in New York for the manufacture of machinery and parts. F. D. Field, 30 Church Street, represents the company.

Fire, Oct. 10, destroyed a portion of the ship chandlery works of William H. Swan & Sons, 45 South Street, New York, including steel cable, chains, anchors, etc., with loss estimated at about \$50,000.

The Enco Electric Novelty Co., New York, has been incorporated at \$24,000 by F. David, M. H. Cohen and M. Smiley, to manufacture electrical specialties. The company is represented by Frederick Lese, 277 Broadway.

The Universal Wire Co., New York, has been chartered under State laws to manufacture wire products. The incorporators are T. H. Hay, L. Hudson and F. W. Wilson. The company is represented by B. L. Brandner, 15 William Street.

The Brooklyn Edison Co., 360 Pearl Street, Brooklyn, is arranging for a bond issue of \$10,000,000, increasing a recently proposed amount of \$3,000,000 to this sum, the proceeds, for the most part, to be used for extensions and improvements in electric generating plants and systems.

The board of managers, Letchworth Village, Thiells, N. Y., M. B. Patterson, 7 Wall Street, New York, president, will receive bids until noon, Oct. 27, for coal-handling equipment for installation at the local power house, and new central heating plant. L. F. Pilcher, Capitol Building, Albany, N. Y., is architect.

The Walker Lubricating Oil & Refining Co., New York, has been incorporated at \$2,000,000 under Delaware laws to construct and operate an oil refinery. The incorporators are T. B. and W. D. Walker and John J. Ford, New York. The company is represented by the Delaware Registration Trust Co., 900 Market Street, Wilmington, Del.

The Cosmopolitan Metal Weather Strip Co., New York, has been chartered to manufacture metal weather strips and other kindred specialties. The incorporators are M. Korman, S. Spalser and Maurice Hotchner, 72 Wall Street.

The Inter City Fuel Co., 17 Battery Place, New York, is taking new bids on revised plans for the erection of an automobile service and repair building, 50 x 100 ft., for company motor trucks and cars, at 423-25 East Twentieth Street, estimated to cost about \$40,000.

Reorganization plans are being perfected by the Willys-Overland Co., 1631 Broadway, New York, automobiles, with plant at Toledo, Ohio, and it is expected to consummate details within about 60 days. A bond issue of \$25,000,000 will be arranged for general financing, operations, improvements, etc.

Following a merger of Canadian and English interests by the Diamond Match Co., 111 Broadway, New York, plans are being perfected for the establishment of a large manufacturing plant at Pembroke, Ont., reported to be estimated to cost in excess of \$500,000, with machinery. The affiliated companies include the Maguire, Patterson & Palmer Co., Pembroke, Ont.; and Bryand & May, Ltd., London, Eng.

The Sheldon Roofing Co., New York, has been incorporated at \$75,000 to manufacture roofing products. The incorporators are F. H. Sheldon, H. S. Stenenson and M. H. Elvidge. The company is represented by Douglass, Armitage & McCann, Woolworth Building.

The Phillipstown Electric Corporation, Phillipstown (Putnam County), N. Y., has been organized under State laws to operate a local electric light and power plant. The company is headed by H. C. Derham and W. M. Benjamin, Phillipstown. It is represented by Osborn, Fleming & Whittlesey, 170 Broadway, New York.

The General Electric Co., 120 Broadway, New York, has acquired an interest in a number of local electrical companies and is perfecting plans for a consolidation under one management. The different companies include E. B. Latham & Co., Royal Eastern Electrical Supply Co., and the Sibley-Pitman Electric Corporation, all of New York, and the Tri-City Electric Co., Newark, N. J. It is said that the new organization will be headed by E. B. Latham as president.

The International Accounting Machine Co., New York, has been incorporated under Delaware laws at \$12,500,000 to

manufacture tabulating machines, registers, etc. The company is represented by the United States Corporation Co., 65 Cedar Street.

The Boker-Buttler Hardware Co., New York, has been merged with H. Boker & Co., 101 Duane Street, steel products, under the latter name.

The Brooklyn Burnall Fuel Saver Corporation, Brooklyn, has been incorporated at \$50,000 by G. H. and G. M. Jackson and L. Reimer, Brooklyn, to manufacture fuel-saving equipment and appliances. The company is represented by Benjamin Krauss, 233 Broadway, New York.

The Duffney Brick Co., Mechanicsville, N. Y., has plans under way for the erection of a new two-story plant to replace its works recently destroyed by fire with loss of about \$200,000, including machinery. Bayard & Massey, 75½ North Main Street, are architects.

The Diamonite Co., Brooklyn, has been incorporated at \$100,000 by W. W. Weese, G. L. Pinkham and W. G. Bushnell, 67 Wall Street, New York, to manufacture fire brick and other refractory products.

Fire, Oct. 5, destroyed a portion of the plant of the Gold Coin Foundry Co., 20 Dewitt Street, Albany, N. Y., stoves and stove castings, with loss of about \$22,000.

The St. Lawrence Boat Works, Ogdensburg, N. Y., has been chartered under State laws to operate a local ship and boat-building plant. The incorporators are G. C. Madill, T. H. Huff and T. S. Spratt, all of Ogdensburg.

The Ansonia No-Fuel System, Inc., New York, has been incorporated under Delaware laws at \$2,000,000 to manufacture machinery and appliances for fuel-saving service. The company is represented by Arthur W. Britton, 65 Cedar Street.

The Norman Iron & Steel Works, Inc., 247 Norman Avenue, Brooklyn, has arranged for the operation of a fabricating plant for the production of structural steel and ornamental iron specialties. D. D. Terker heads the company.

The Millville Iron Works, Inc., Millville, N. J., has been incorporated at \$100,000 by Samuel and Daniel E. Campbell and Lester Fleetwood, Sixth Street and Florence Avenue, to manufacture iron and steel products.

The Richelieu Motor Corporation, 649 Mattison Avenue, Asbury Park, N. J., has plans under way for the erection of a plant on property recently acquired on Asbury Avenue, for the manufacture of automobiles and parts. The initial building will be one and two-story, 80 x 200 ft., with power plant, and is estimated to cost about \$200,000 with machinery. Samuel A. Reeves is president.

Toft & Freyer, Perth Amboy, N. J., will build a new one-story wheelwright and forge shop on East Avenue, estimated to cost about \$15,000.

The Paterson Iron Fence Co., Paterson, N. J., has been chartered under State laws by William C. Mickel, Francis Dalmotte and Peter J. Meyer, to manufacture iron fencing and kindred iron products.

C. E. and I. Cuneo, 23 Fulton Avenue, Jersey City, N. J., will build a one-story automobile repair and service works, 100 x 100 ft., on Hudson Avenue, near Eighth Street, to cost about \$60,000.

The Acme Handle Co., 228 Orient Avenue, Jersey City, N. J., has been incorporated with a capital of \$70,000 by Charles L. Vondreele and I. H. Brand to manufacture wire and wood handles and kindred specialties.

The United Railway Signal Co., Providence, R. I., has filed plans for the erection of a new plant at Edgar, near New Brunswick, N. J., comprising three one-story buildings. Construction will start at once.

The J. W. Kirkbride Body & Storage Co., Pleasantville, N. J., has been incorporated at \$50,000 by Alexis D. Whitson and John W. Kirkbride, Pleasantville, to manufacture automobile bodies.

The B. M. & T. Auto Repair Co., 2329 Boulevard, Jersey City, N. J., has filed notice of organization to operate a general machine and repair works and manufacture automobile parts. Robert J. Mitchell, 193 Madison Avenue, heads the company.

The Federal Carbonic Gas Co., Jersey City, N. J., has been incorporated at \$500,000 by Frank E. Taylor, Thomas J. Burke and Emmett Sullivan, 57 Randolph Avenue, to manufacture carbonic and other gas for industrial service.

The Kelsey Motor Co., 25 Branford Avenue, Newark, N. J., has awarded a contract to Enstice Brothers, 40 Clinton Street, for the erection of an automobile manufacturing plant on Washington Avenue, Belleville, N. J. The initial building will be one and two-story, with one-story portion, 100 x 275 ft., to be used for manufacturing service. The two-story section will be employed for offices. It is proposed to develop a capacity of about 3000 cars per year.

The Adlanco Industrial Products Co., Newark, N. J., has

been incorporated at \$100,000 by Frank D. Ross, Harry A. and George V. Hanley, 810 Broad Street, to manufacture tools and other mechanical specialties.

The National Light & Electric Co., Newark, N. J., has been incorporated at \$100,000 by George Ollendorf, Albert R. Hamerslag and Harry Hirsch, Newark, to manufacture electric lights, electrical fixtures and kindred equipment. The company is represented by Harry A. Friedman, 9 Clinton Street.

The Four Chime Auto Whistle Co., 23 Marshall Street, Newark, N. J., has filed notice of organization to manufacture metal automobile horns, etc. Roland J. Hines, 212 Washington Street, heads the company.

The American Metal & Cornice Works, Elizabeth, N. J., has been chartered under State laws by Harry Lasser and Jacob Addelstein, 6 South Street, to manufacture metal building products.

The Hendricks Brass & Copper Co., 130 Market Street, Newark, N. J., has filed notice of organization to manufacture copper, brass and other metal products. Elwood Hendricks, 645 Springdale Avenue, East Orange, N. J., heads the company.

The Sun Machinery Co., Newark, N. J., has purchased the building, No. 28 Mechanic Street, and has been located there since Oct. 15. It has also taken a long lease on the two-story brick building, No. 4 Campfield Place, Newark, N. J.

Philadelphia

PHILADELPHIA, Oct. 18.

The Bureau of Highways, City Hall, Philadelphia, has taken bids for the erection of a new one-story machine shop at Delaware and Fairmount avenues, to be constructed in conjunction with a new service building for municipal motor trucks and automobiles at this location.

The Bradley Mfg. Co., Philadelphia, is being organized by John H. Bradley, William Storch and Walter L. Kalbach, to manufacture metal furniture and equipment for hospital and kindred service. Application for a State charter will be made on Nov. 7. Scott, Van Dusen, Archbald & Johnson, Stephen Girard Building, represent the company.

The new plant of Horace T. Potts & Co., 316 North Third Street, Philadelphia, manufacturers of iron and steel products, will be located on the southeast corner of D Street and Erie Avenue, and will consist of a number of buildings of various sizes, comprising main iron-working plant, foundry, power house and office building. It is estimated to cost about \$450,000. Construction will be commenced at once.

William H. Robinson, Philadelphia, has leased property at 1823 Ludlow Street for the establishment of a steel stamping works, with department for electro-plating and kindred operations.

The Ace Motor Corporation, Philadelphia, has been incorporated under Delaware laws at \$2,340,000, as a reorganization of the company of similar name, for the manufacture of automobiles and parts, with plant at Erie Avenue and Sepviva Street. Officials of the Haverford Cycle Co., 503 Market Street, who recently acquired the former Ace company and plant, head the new organization. The incorporators are Abraham S. Buchman and Harry O. Boreth. The company is represented by the Corporation Trust Co. of America, du Pont Building, Wilmington, Del.

A new one-story power house will be constructed by the Consolidated Ice Co., 2331 Bodine Street, Philadelphia, at 2335 Bodine Street. Plans have been completed.

The Standard Tin Foil Corporation, Philadelphia, a subsidiary of the Conley Tin Foil Co., 521 West Twenty-fifth Street, New York, has disposed of its plant at Torresdale Avenue and Church Street to Herbert Newton, for a consideration stated to be \$150,000. The new owner will occupy the property for a different line of manufacture.

Thomas J. Clark, 2728 North Second Street, Philadelphia, has filed plans for the erection of a one-story addition to his machine and wagon repair shop at 2732 North Second Street.

The Cutter Electrical & Mfg. Co., Nineteenth and Hamilton streets, Philadelphia, manufacturer of circuit breakers, switches, etc., has acquired the four-story factory at location noted, heretofore held by the estate of John W. Graham, for about \$150,000.

The Philadelphia Ship Repair Co., Philadelphia, has disposed of its four-story factory at the northeast corner of Thirty-seventh and Sansom streets to J. S. Ware, who will use the property for other industrial service.

The McFarland Foundry & Machine Co., Inc., Willow Street, Trenton, N. J., will build a new two-story addition to its foundry on New York Avenue, 50 x 52 ft., to cost about \$12,000.

The Forbes Aluminum Products Co., Steele Building,

Easton, Pa., has awarded a contract to the R. T. & C. D. Stewart Construction Co., 26 Centre Square, for the erection of its proposed new plant in the South Side district for the manufacture of cooking utensils and other aluminum products. The works will consist of a number of buildings, with initial units to cost about \$150,000, and ultimate plant, as projected, close to \$500,000. The company was recently incorporated under Delaware laws with capital of \$4,500,000 and has established New York offices at Thirty-eighth Street and Fifth Avenue. Ewing M. Forbes is president. A. D. Chidsey, Jr., 341 Northampton Street, Easton, is architect and engineer.

The Metropolitan Edison Co., Reading, Pa., has arranged for a bond issue of \$216,500 and stock issue of \$100,000, the proceeds to be used for general operations, extensions, etc.

The York Castings Co., York, Pa., has been incorporated under Delaware laws at \$100,000, to manufacture iron, steel and other metal castings. The incorporators are Elmer Workman, Abraham and H. C. Trattner, York. The company is represented by the Colonial Charter Co., Ford Building, Wilmington, Del.

The Raleigh Motors Corporation, Reading, Pa., will install equipment at its local plant, recently acquired, for the manufacture of automobiles.

The Dunlap & Jones Co., Pottsville, Pa., is planning for the rebuilding of its foundry, destroyed by fire Oct. 7.

The Oakland Service Co., 24 South River Street, Harrisburg, Pa., is taking bids for the erection of a new automobile repair and service works, one-story, 60 x 120 ft., estimated to cost about \$30,000. A. Allen heads the company. W. W. Johnston, 7 North Front Street, is architect.

John H. Ware, Jr., Oxford, Pa., and associates have organized the Penn-Oxford Electric Co. and the New London Electric Co., under State laws, to operate electric light and power plants in this section.

Fire, Oct. 9, destroyed a portion of the plant of the Memphis Steel Construction Co., South Greensburg, Pa.

Plans for a new one-story power house are being prepared by John J. Hawley, Traders' Bank Building, Scranton, Pa., architect, to be erected by the Mount St. Mary's Convent, 2300 Adams Avenue. Bids will be asked at an early date.

The Lackawanna Railroad Co., 90 West Street, New York, is developing plans for the electrification of a portion of its Scranton, Pa., division, and estimates of cost, including power plants, electric locomotives and other equipment are being prepared. The completion of the project will be followed by the electrification of other divisions of the railroad, particularly in New Jersey.

Fire, Oct. 6, destroyed a portion of the flour mill and elevator of the Hanover Milling Co., Hanover, Pa., with loss, including machinery, of \$75,000.

The Greenville Steel Car Works, Sharon, Pa., has closed a contract with the Erie Railroad for the repair of 1000 steel cars at its local plant.

The new Standard Hardware Works, Harrisburg, Pa., has filed notice of change of name to the New Standard Corporation.

New England

BOSTON, Oct. 17.

A few sales of single tools constitute the week's chief business. The auction sale of the machine tools of the Chapman Mfg. Co., Winchester, Mass., was attended largely by second-hand machinery dealers and they were the chief purchasers. Extremely low prices prevailed. For instance, standard automatic machines that once sold for about \$3,000 were knocked down at \$350. A group of five wood-tilted lathes sold for \$300 for the lot.

Optimistic developments are reported in spots. Large orders have been placed with brass plants in the district containing Ansonia, Waterbury and Torrington, Conn., thereby causing the working forces to be increased considerably. The Westfield Mfg. Co., Westfield, Mass., maker of Pope bicycles, has just secured the American rights for manufacturing the Gibson pedal, a Canadian product that has met with much success. A new industry is getting under way, the Spencer Thermostat Co., Cambridge, Mass., which just bought a 12-in. Hendey lathe and will need more equipment.

The Machinery Co. of America, Big Rapids, Mich., is making a substantial reduction in the price of filing room and knife grinding machinery. Some of the week's sales have been: Fluting planer to a textile interest; a 5-ton, 28-ft. span Niles crane to the Power Construction Co., Worcester, Mass.; a double punch and shear for the Portland terminal shops of the Maine Central Railroad.

There are intimations of price raising by certain machine tool builders.

The Connery Machine Co., 56 Harrison Avenue, Spring-

field, Mass., is planning for the construction of a new one-story machine shop.

The Rhode Island Crucible Steel Co., Providence, R. I., has been incorporated at \$100,000 by Albert B. Benson, George C. and Carl A. Hagstrom, 185 Oakhill Avenue, Pawtucket, R. I., to manufacture steel and iron products.

The Crandall-Johnson Co., Stamford, Conn., has been incorporated at \$50,000 by A. I. Crandall, Stamford, and associates to manufacture machinery and other mechanical equipment.

Fire, Oct. 5, destroyed the paper mill of the G. A. Robertson Co., Hinsdale, N. H., with loss estimated at about \$100,000, including machinery.

The Standard Machinery Co., Mystic, Conn., has filed notice of withdrawal of its recent intention of dissolution and will be continued in operation.

Mechanical and electrical equipment will be installed in the new one-story industrial school to be erected at the Connecticut State Reformatory, Cheshire, Conn., estimated to cost close to \$50,000.

The Standard Metalwork Co., Thompsonville, Conn., has filed final notice of dissolution under State laws.

Charles R. Scott and W. E. Currier, Amesbury, Mass., have formed a partnership under the name of the Amesbury Auto Body Co. for the manufacture and repair of automobile bodies and tops.

Dragat & Traubman, 340 Windsor Avenue, Hartford, Conn., have rejected bids recently received for the erection of a three-story automobile repair and service works on Windsor Avenue, 100 x 100 ft., estimated to cost about \$100,000, and will hold the project in abeyance until early in the coming year. G. A. Zunner, 182 High Street, is architect.

The Reeves Vacuum Cleaner Co., Milford, Conn., manufacturer of vacuum cleaners, parts, etc., has filed notice of change of name to the Reeves Co.

A new one-story power house will be erected at the plant of the Portland Silk Co., Middletown, Conn.

The board of education, Pawtucket, R. I., will install machine tools, electrical equipment and other mechanical apparatus in its proposed new manual training and industrial arts school on Fountain Street, estimated to cost in excess of \$1,000,000 complete.

The Massachusetts Pressed Steel Co., 72 Commercial Street, Worcester, Mass., has been formed to manufacture metal stampings and will be in the market for new tools or good second-hand tools within the near future. At present its requirements are a 16-in. used American lathe, 6-ft. bed, and a 4 or 6-in. Pratt & Whitney die slotter.

Buffalo

BUFFALO, Oct. 18.

The Atlas Crucible Steel Co., Dunkirk, N. Y., is arranging for a bond issue of \$4,000,000, of which \$2,000,000 will comprise an initial sale, the proceeds to be used for general operations, improvements, etc.

The Merger Tire & Tube Corporation, Buffalo, has been incorporated at \$500,000 by C. J. Allen, J. S. Knibloe and E. H. Sturgeon, 40 East Mohawk Street, to manufacture automobile tires and tubes.

A new gas filtration, purifying and pressure plant, estimated to cost about \$400,000, with machinery, will be constructed by the Niagara Gas Corporation, 186 Main Street, Buffalo, near the works of the Donner Union Coke Co.

The Lock-in-Pin Products Corporation, Buffalo, has been incorporated at \$200,000 by M. J. Williams, J. Latchford and M. Carey, Buffalo, to manufacture metal pins and kindred products. The company is represented by George B. Burd, Erie County Bank Building.

The plant of the M. L. Oberdorfer Brass Corporation, East Water Street, Syracuse, N. Y., has been acquired by the Way-Cleanse Corporation, manufacturer of mechanical specialties, same city. It will be occupied and equipped at once by the new owner and machinery now located at Sandusky, Ohio, will be removed to this location. The Way-Cleanse company is capitalized at \$5,000,000, and plans extensive operations.

The Lamson Co., Lowell, Mass., manufacturer of merchandise conveyors, pneumatic tube systems, etc., has awarded a contract to the Aherthaw Construction Co., Boston, for the erection of four buildings at Syracuse, N. Y., for its proposed new local works. The structures will be one-story and aggregate about 150 x 300 ft.; with equipment, the plant is estimated to represent an investment of over \$500,000. Monks & Johnson, Boston, are architects.

The Smith-Hall-Cortright Co., Owego, N. Y., has been incorporated at \$50,000 by E. Cortright, W. Hall and E. L. Smith, Owego, to manufacture automotive appliances, lens,

etc. The company is represented by J. S. Truman, Owego.

The Achilles Tire & Rubber Co., Floral Avenue, Binghamton, N. Y., has had plans prepared for the rebuilding of the portion of its plant recently destroyed by fire, estimated to cost about \$16,000.

The Chapin & Baker Mfg. Co. and the Skelton Tool Co., Syracuse, N. Y., manufacturers of special tools and mechanical specialties, have been merged under the name of the Baker-Skelton Co. and will continue the operation of the local plants.

The Lockport Dry Dock Co., Lockport, N. Y., has been chartered under State laws to operate a dry dock and ship-building works. The incorporators are B. L. and L. L. Cowles, Lockport. The company is represented by J. W. Stone, attorney, Buffalo.

The Rochester Rolling Mills, Inc., Rochester, N. Y., has been incorporated at \$100,000 by F. Christman and J. H. Farrell to manufacture iron and steel products. The company is represented by F. I. Stoker, attorney, Rochester.

The plant of the Precision Engineering Co., Hopkins Avenue, Jamestown, suffered a \$20,000 damage by fire Oct. 4.

Fire, Oct. 12, caused a loss of \$50,000 to the plant of the Buffalo Specialty Co., Bridgeburg, Ont.

Chicago

CHICAGO, Oct. 17.

The decision of the Inland Steel Co. to roll standard-section rails at its Indiana Harbor plant has resulted in the reopening of negotiations, broken off over a year ago, for rail-finishing equipment. One rail ending machine has already been purchased and orders for a half-dozen multiple-spindle rail drills and a number of straighteners and saws will be placed in the near future. The plant addition which will house the rail finishing equipment will be served by two 15-ton overhead traveling cranes, the purchase of which has not yet been consummated.

Railroads continue to show interest in the machine tool market. The Santa Fe has added an 18-in. x 10-ft. engine lathe and a 36-in. draw-cut shaper to its outstanding list, a substantial portion of which it is expected to purchase within the next few weeks. The Chicago & North Western has asked for prices on a number of tools which are to be included in its 1922 budget. The Illinois Central is said to be contemplating entering the market for additional requirements. From St. Louis comes word that the Missouri, Kansas & Texas has sent out an inquiry for 75 machines.

Actual bookings of local dealers are still unsatisfactory. Considerable interest was aroused last week by the arrival in Chicago of Jose Sanchez, machinery dealer of Mexico City, Mex., who is in the United States to purchase equipment suitable for his trade. Among the orders which he has placed, one calls for 20 South Bend engine lathes and another for a Marvel hack saw and a Dumore grinder.

Only one price reduction is reported since a week ago—a 10 per cent cut on bolt cutters by the Landis Machine Co.

Liquidation of the equipment of companies which have gone bankrupt continues to put second-hand machines in the market. To-day all of the assets of the American Metal Products Co., 1331 West Washington Street, Chicago, are being sold at public auction. Included are seven engine lathes, 19 punch presses, three milling machines, a turret lathe, a shaper, 11 drill presses, besides a considerable quantity of miscellaneous equipment and supplies.

The crane market is quiet. Among the few recent purchases is a five-ton three-motor overhead traveling crane bought from the Whiting Corporation for the new warehouse at Western Avenue and Forty-second Street, Chicago, of Whitney & Ford, dealers in plumbing supplies.

Mandel Brothers, Chicago, have had plans drawn by I. S. Stern, 35 South Dearborn Street, for a one-story and balcony, with basement for boiler and coal room, garage, 125 x 193 ft., North Crawford and Schubert avenues, to cost \$75,000.

J. Dooley is receiving bids through Halperin & Braun, 19 South La Salle Street, Chicago, for a one-story garage, 75 x 125 ft., Loomis Street near Adams Street, to cost \$25,000.

The J. S. Heath Co., manufacturer of structural and ornamental bronze products, 306 West Ontario Street, Chicago, has let a contract for the erection of a foundry and machine shop, 100 x 105 ft., Waukegan, Ill., to cost \$100,000.

The Waukegan Foundry Co., a recently organized concern, commenced operations in the Manufacturers' Terminal, Waukegan, Ill., Oct. 4. Officers of the company include A. K. Barr, formerly with the Barr Pattern Co., North Chicago, and Elmer Skidmore, former credit man for the Chicago Hardware Foundry Co.

P. W. Kempster, Sterling, Ill., is having plans prepared

for the construction of a one-story garage, 50 x 142 ft., to cost \$40,000.

The Grand Rapids Show Case Co., Grand Rapids, Mich., has had plans prepared for a five-story show case factory, 102 x 132 ft., to cost \$75,000.

The Central Illinois Light Co., Peoria, Ill., has arranged for a bond issue of \$1,053,000, the proceeds to be used for general operations, extensions and improvements in plant and system. R. S. Wallace is vice-president and general manager.

The Benton Cold Storage Co., 29 Ward Building, Benton, Ill., has been incorporated at \$100,000 to operate a cold storage and refrigerating plant. The incorporators are Robert R. Ward, R. C. Cluster and William C. Ludwig.

The Quartermaster Department, United States Army, Washington, D. C., has broken ground for a large hangar at the Scott Field, near Belleville, Ill., estimated to cost about \$1,000,000, including shops for construction and repair work, electrical equipment and other mechanical apparatus. Major Frank Kennedy is in charge.

The Moline Plow Co., Moline, Ill., following reorganization by a creditors' committee, is arranging for the resumption of operations at its plant at Rock Island, Ill., at an early date. The plant will be used for the manufacture of six-cylinder motors for the "Stephens" automobile, and necessary facilities will be provided for this branch of production. It is expected to employ about 100.

A power plant, 33 x 60 ft., will be constructed by the Waterway Paper Products Co., Kedzie Avenue and Thirty-second Street, Chicago, in connection with the erection of a new one-story manufacturing plant, 80 x 180 ft., estimated to cost close to \$200,000, including machinery. Frank D. Chase, 645 North Michigan Avenue, is architect and engineer.

The common council, Adrian, Minn., has completed plans for the construction of a municipal electric light and power plant to cost about \$40,000. M. J. Farrager is clerk.

The Repeating Devices Corporation, 670 West Randolph Street, Chicago, has been incorporated at \$50,000 by E. M. Sinnott, Martin J. Isaacs and A. J. Johnson to manufacture sound-producing instruments and mechanical mechanisms for operation.

The Edward Katzinger Co., 910 West Washington Boulevard, Chicago, has organized the Ekco Engineering Co., which will specialize in the manufacture of a high-speed dough-mixing machine. It is ready to negotiate with makers of special machinery to produce these machines on a contract basis.

C. W. Marthens & Co., Chicago, have purchased a 20-ton, 3-motor overhead traveling crane from the Northern Engineering Works, Detroit.

Pittsburgh

PITTSBURGH, Oct. 17.

Announcement by the United States Steel Corporation that it had recommended to its subsidiaries the expenditure of \$10,000,000 for plant betterments does not occasion much optimism in the machinery trade here. The common belief is that this sum will be spent to provide employment for as many men as possible and only for equipment involving small expenditures. The inquiry for four cranes put out some time ago by Boviard & Seyfang Co., Bradford, Pa., again is showing life and it is expected that an award will be made shortly for two 7½-ton cranes and one 5-ton crane. New crane inquiries are few, but requests for revised prices against some old inquiries are being received. Machine-tool activities still are limited. A sale of one large face grinder involving about \$6,000 is noted, but individual transactions rarely amount to as much as \$1,000.

The Clarion River Power Co., Foxburg, Pa., has surveys under way for the erection of a new hydroelectric generating plant on the Clarion River, near Foxburg, estimated to cost over \$2,000,000. The project is being financed by H. D. Walbridge & Co., 14 Wall Street, New York, and plans will be prepared under the direction of this organization.

The Monarch Flux & Metal Co., Tarentum, Pa., has been incorporated under Delaware laws at \$100,000 to manufacture metal products and other specialties. The incorporators are Thomas H. and Howard Reighard and John Tasick, Tarentum. The company is represented by the Capital Trust Co. of Delaware, Dover, Del.

The Penn Public Service Corporation, Johnstown, Pa., has arranged for a bond issue of \$1,082,000, the proceeds to be used for general operations, extensions and improvements in electric power plants and system.

The Pittsburgh Engineering, Foundry & Construction Co., Pittsburgh, has been chartered under State laws to manufacture machinery, iron and steel castings, etc. J. B. Orr, Farmers' Bank Building, is treasurer.

The Duquesne Light Co., Chamber of Commerce Building, Pittsburgh, has completed plans for the erection of a new one-story power house in Mt. Lebanon Township for electric service in this district.

The H. T. Lambert Co., Huntington, W. Va., recently organized with a capital of \$200,000, is perfecting plans for the erection of a plant for the manufacture of frogs, switches, and kindred railroad equipment. H. T. Lambert is president and E. A. Thomas, secretary and treasurer.

The Auto Motor Mfg. Co., Dunbar, W. Va., manufacturer of automobile motors and other equipment, will remove its plant to Point Pleasant, near Gallipolis, Ohio, where increased facilities will be provided. It is proposed to give employment to about 250 at the new location. The company is operating with a capital of \$2,000,000.

The Kentucky & West Virginia Power Co., 30 Church Street, New York, an interest of the American Gas & Electric Co., same address, has acquired the power plant of the Grafton Power & Electric Co., Grafton, W. Va., bankrupt. The company will extend and improve the generating plant, with the installation of new equipment, and will operate the plant in conjunction with the new generating station at Logan, W. Va., to cost about \$1,500,000, as well as with the proposed new hydroelectric plant on the Cheat River at Caddell, near Kingwood, W. Va. Ground for this latter station is now being cleared. N. M. Argabrite is vice-president and general manager.

A. B. Knight, Fairmont, W. Va., has awarded a contract to J. M. Kisner & Brother, Fairmont, for the erection of a new two-story machine shop on East Park Avenue. A special department will be installed for automobile work, including cylinder grinding, etc.

The Bonita Art Glass Co., Wheeling, W. Va., is completing plans for the erection of a new one-story shop building at its works, 60 x 80 ft., estimated to cost about \$35,000, including another structure to be built at the same time. George E. House is president.

The Ferres Motors Co., 615 Seventh Street, Parkersburg, W. Va., has plans under way for the erection of a two-story repair and service works, 50 x 140 ft. D. P. Ferres is president.

Detroit

DETROIT, Oct. 18.

The Detroit Trailer Co. has just shipped the first 50 trailers on an order for 500 from the Brazilian Government. The trailers, equipped with steel platform bodies, are to be used for the construction of a dam 250 miles in the interior.

Manning, Maxwell & Moore, Inc., Muskegon, Mich., have booked an order from the Santa Fe Co. for eight cranes, of which one will be of 250-ton capacity, six of 15-ton and one of 5-ton.

The S. C. McLouth Foundry Co., Marine City, Mich., is building an addition to its plant and has orders on hand that will keep the plant busy for a year. This company recently began work on an order for 500,000 pistons for motor car engines.

The American Bushings Corporation, Marysville, Mich., is now working three full shifts, day and night. October production will total 1,300,000 bushings, and the daily output has been increased from 50,000 to 60,000. New orders have been received that will make possible an output of 1,500,000 bushings in November. This company is reported to be in the market for additional equipment to take care of the prospective increases in production.

The Ithaca Washing Machine Co., Ithaca, Mich., has been organized to manufacture washing and ironing equipment for laundries. The company is headed by Chester and William Swartz, Ithaca.

A shoe manufacturing concern has been organized in White Cloud, Mich., by F. H. Welch, Coldwater, Mich. Mr. Welch owns a majority of the \$10,000 capital stock of the company. It is planned to start production soon with a force sufficient to make 100 pairs of shoes a day.

The Reynolds Spring Co., Jackson, Mich., has let to the H. G. Christman Co., Detroit, the contract for construction of its factory addition, to cost about \$125,000 and to be a two-story building, reinforced concrete, 130 x 201 ft.

Plans have been made by C. H. Freeland, Lansing, Mich., for a \$600,000 labor temple in that city, the building to be six stories high.

An eight-story store and office building will be constructed at Woodward and Horton avenues, Detroit, by M. Basso, Detroit.

The Gem Foundry Co., Muskegon, Mich., has been incorporated by Harry J. Pangburn, Samuel Feltman and Jacob A. Poupstra, of that city, to do a general foundry and machine

shop business and to make castings and articles of brass, aluminum, etc. The capital stock is \$10,000.

The Detroit Hexagon Drill Co., capitalized at \$300,000, has filed notice of dissolution with the Michigan Secretary of State.

The voters of Flushing, Mich., have voted in favor of bonding the village for \$60,000 to be spent in improvements to the waterworks.

Hamtramck, Mich., a suburb of Detroit, has voted to bond the city for \$25,000 for an additional unit for the municipal incinerating plant.

The Iron River Water, Light & Telephone Co., Iron River, Mich., has let the contract for a new power plant.

It has been announced that the Standard Sanitary Mfg. Co. will locate a branch plant in Detroit.

The recently organized Grand Rapids Metal Products Co., 1530 Monroe Avenue, Grand Rapids, Mich., has taken over the plating plant of the Miller Plating Co. of Grand Rapids. The new company is preparing to manufacture automobile hardware specialties, metal furniture, phonographs and refrigerators. The plating plant will give the company a complete department for plating and polishing gold, silver, copper, brass, nickel and zinc.

The Wright Plow Works, Greenville, Mich., which was recently purchased by the Cameron Motors Corporation, New York, will be expanded and equipped to produce castings for a new tractor to be produced by the Cameron company.

The Gier Pressed Steel Co., Lansing, Mich., has started shipments of its new Gier Tuarc steel wheels, a solid carload having been sent to the Steel Wheel Co., New York, last week.

The Transue-Williams Steel Forge Co., Marysville, Mich., will hold in temporary abeyance the erection of its proposed new plant addition on West Ely Street, estimated to cost about \$45,000. R. H. Gordon is engineer. O. F. Transue is president and general manager.

Officials of the Champion Spark Plug Co., Toledo, Ohio, have organized a subsidiary, the Champion Porcelain Co., capitalized at \$750,000, to take over and operate the plant of the Jeffrey-Dewitt Co., Detroit, manufacturer of spark plug porcelains, etc. J. A. Jeffrey is president.

The Leafless Spring Co., Grand Rapids, Mich., has been incorporated at \$300,000 by A. D. Swain and John Austin, Grand Rapids, and Walter S. Kilbourne, Stephenville, Mich., to manufacture springs for automobile service and kindred steel products.

The Root Spring Scraper Co., Kalamazoo, Mich., has been incorporated at \$40,000 by Fred N., J. M. and Newton Root, all of Kalamazoo, to manufacture ice scrapers for attaching to street cars, road scrapers and kindred products.

The John Widdecomb Co., Fifth and Muskegon streets, Grand Rapids, Mich., is building a new machine shop, in conjunction with an automobile service works, two-story, 50 x 75 ft., at address noted.

The Detroit Sand, Lime & Brick Co., 507 Vinton Building, Detroit, plans to construct a brick plant, with departments for the production of other clay products. Bids will be asked early in November.

R. L. Blackman, Martlette, Mich., is completing plans for the erection of a local power plant for increased light and power service. Bids for construction will be asked early in 1922.

The Jennison Hardware Co., 901 North Water Street, Bay City, Mich., has preliminary plans under way for the erection of a plant on Second Avenue, comprising three units, estimated to cost about \$400,000. H. W. Jennison is president.

The Wolverine Truck-Trailer Co., 3931 Greeley Street, Detroit, will place on the market shortly a semi-trailer for attachment to one-ton Ford trucks. The company is equipping for production.

The Atlas Drop Forge Co., Lansing, Mich., is preparing for the erection of an additional plant unit.

Construction on a plant for the Michigan Sheet Metal Works, Lansing, Mich., is to be completed in about 30 days. It will be one story, 45 x 75 ft., and will cost about \$5,000.

The new Pere Marquette Railroad engine terminal at Saginaw, Mich., will be opened soon. The new work comprises a 30-stall engine house, machine shop, power house of 1000 hp. capacity, 100-ft. turntable, 500-ton coal dock, modern cinder pit, electrically operated ash-handling outfit, storehouse and general service building. The engine house is equipped with the latest improved hot washout equipment.

The Jeffrey-Dewitt Co., Detroit, manufacturer of spark plug insulators, has been taken over by the Champion Porcelain Co., a new concern capitalized at \$750,000 and controlled by the Champion Spark Plug Co., Toledo. J. A. Jeffrey is president of the new company and M. C. Dewitt vice-president.

The Detroit Edison Co. will soon start the construction

of a new sub-station at Webberville, Mich., to supply current for towns in the vicinity.

The Haynes Wire Wheel Works, Jackson, Mich., will soon start work on the erection of a one-story tool room building, 80 x 190 ft., to cost about \$25,000.

The Hill-Curtis Co., Kalamazoo, Mich., has purchased the grinding and polishing stand and accessory business of the Webster & Parks Tool Co.

The Leafless Spring Co., Grand Rapids, Mich., has been incorporated with capital of \$300,000 to manufacture automotive springs and parts and accessories. The incorporators are A. D. Swain and John Austin, Grand Rapids, Mich., and Walter S. Kilbourne, Stephenville, Mich.

The Root Spring Scraper Co., Kalamazoo, Mich., has been incorporated to manufacture snow and ice scrapers for attachment to street cars, life guards and fenders for street cars, road scrapers, floaters and scrapers for use on highways. The capital is \$40,000. The incorporators are Fred N., Josephine M., Marie J. and Newton Root, all of Kalamazoo. Production will be started as soon as plant and equipment can be secured.

The Root Spring Scraper Co., Kalamazoo, has been reorganized with a paid in capital of \$40,000.

The S. C. McLouth foundry, Marine City, has contracts for 500,000 pistons for gasoline engines and is erecting an addition.

Baltimore

BALTIMORE, Oct. 18.

The Wizard Check Indorser & Printing Machine Co., Calvert Building, Baltimore, will defer a call for bids for the erection of a plant at Highlandtown, near Baltimore, until early next year. The plant will be one-story, 90 x 150 ft., and, with power plant, is estimated to cost over \$200,000. F. S. Weise is president. E. A. Fletcher, 407 North Charles Street, is architect.

The Maryland Car Wheel Works, Curtis Bay, Baltimore, manufacturer of car wheels, organized under West Virginia laws, is arranging for a dissolution of the company. The action was approved at a meeting of stockholders on Sept. 29. A. G. Wellington is president.

The Carter Motor Car Co., Bond Building, Washington, D. C., organized under the laws of South Dakota, with capital of \$2,000,000, has acquired the plant of the Washington Motor Car Co., Hyattsville, Md., for a new works for the manufacture of automobiles and parts. The present plant will be extended and new equipment installed.

The Industrial Mechanical Equipment Co., Wilmington, Del., has been incorporated at \$200,000 to manufacture mechanical products. The company is represented by the Corporation Service Co., Wilmington.

The Atlas Alloy Corporation, Wilmington, Del., has been incorporated at \$100,000 to manufacture iron, steel and other metal products. The company is represented by the Corporation Trust Co. of America, du Pont Building, Wilmington.

The Big Savage Fire Brick Co., Frostburg, Md., has commenced the erection of a new dryer plant at its works and will follow this structure with other plant buildings of various sizes. The extensions are estimated to cost about \$85,000. D. A. Benson is manager.

The Cumberland Foundry & Supply Co., Cumberland, Md., has leased the foundry of the Union Mining Co., Mount Savage, near Frostburg, Md., for a new plant. It is proposed to inaugurate operations at once for the production of aluminum and other metal castings. Frank Snyder is manager.

The Tru-Matic Tube Co., Wilmington, Del., has been incorporated under State laws at \$1,000,000, to manufacture automobile tires and tubes. Mark W. Cole, North State Street, Dover, Del., represents the company.

Property of the Delaware City Light & Water Co., Delaware City, Del., including plant, equipment, etc., will be offered at public sale on Nov. 1, by Chester E. Baum, receiver for the company.

The Cloutier Harrow Co., Ltd., Wilmington, Del., has been incorporated at \$250,000, to manufacture plows, harrows and other agricultural implements. The company is represented by the Colonial Charter Co., Ford Building, Wilmington.

The Phillipp-Kell Co., Inc., Holliday and Centre streets, Baltimore, manufacturer of sheet metal products, will hold in temporary abeyance the erection of its proposed new one- and two-story plant on Hanover Street, 70 x 165 ft., and expects to call for bids early in 1922. It is estimated to cost about \$50,000.

Ford & Manion, Inc., Wilmington, Del., has been in-

incorporated at \$100,000 by Joseph J. Ford and Francis T. Manion, Wilmington, to manufacture electrical heating equipment and appliances. The company is represented by Henry R. Isaacs, Equitable Building.

The Joy Mfg. Co., Wilmington, Del., has been incorporated at \$1,500,000 under State laws, to manufacture coal mining machinery, including equipment for cutting, loading, etc. The company is represented by the Corporation Trust Co. of America, du Pont Building, Wilmington.

The W. J. Westbrook Elevator Co., Greensboro, N. C., is planning for the erection of a new foundry, to be used for the production of semi-steel and iron castings.

W. G. Martin, Leesburg, Ga., and associates, are planning a new hydroelectric generating plant on the Broad River, near Mt. Airy, Ga.

The Bureau of Yards and Docks, Navy Department, Washington, D. C., has foundation work under way for its proposed new one-story machine shop at Hampton Roads, Va., estimated to cost \$104,800, including equipment.

The Roanoke River Development Co., 317 Mutual Building, Richmond, Va., has been granted permission by the Federal Power Commission, Washington, D. C., to proceed with the erection of its proposed new hydroelectric generating plant on the Roanoke River, near Clarksville, Va. It is proposed to construct two power stations, one with a capacity of 50,000 hp. and the other of 10,000 hp.

The Lynchburg Iron & Metal Co., Lynchburg, Va., has been reorganized and the new company of the same name has taken over the plant and property of the former organization.

Fire, Oct. 14, destroyed a large portion of the docks of the Charleston Terminal Co., Charleston, S. C., Columbus Street, including cargo-handling machinery and equipment, with loss estimated at close to \$1,000,000.

The common council, Rockymount, Va., is planning for the immediate installation of new machinery for the municipal waterworks, to include engines, pumping equipment and auxiliary apparatus. M. B. Hutcherson is mayor.

The board of directors, State Hospital for the Insane, Goldsboro, N. C., is planning to erect a new power plant to cost about \$100,000. H. A. Underwood, 227 Forest Road, Raleigh, N. C., is engineer.

Following a merger of the Enterprise Lumber Co. and Whiteville Lumber Co., Goldsboro, N. C., including other smaller local interests, plans are under way for the erection of a large central lumber mill in this section. Nathan O. Berry is in charge.

The Blue Ridge Power Co., Spartanburg, N. C., is considering the erection of a new power plant in the vicinity of Hendersonville, N. C. J. A. Law is head.

Fire, Oct. 6, destroyed the lumber plant of Wright Brothers, Johnston, S. C., with loss estimated at about \$40,000, including machinery.

The Columbia Railway, Gas & Electric Co., Columbia, S. C., has tentative plans under way for the construction of a new hydroelectric generating plant at the terminus of a canal to be built, in accordance with permission received from the Federal Power Commission, Washington, D. C., diverting waters from the Santee and Cooper rivers.

The plant of the Bowle Stove Co., Rome, Ga., formerly the Rome Stove Works, which was recently destroyed by fire, will be rebuilt. H. E. Henson is superintendent.

J. H. Roberts, Charleston, S. C., is making plans for the establishment of a plant for the manufacture of geometric squares.

The W. J. Westbrook Elevator Co., Greensboro, N. C., plans to build a foundry.

The Herculo Lock Guard Co., 15 South Gay Street, Baltimore, manufacturer of a guard which is said to make locks "jimmy" proof, has placed an order for an initial quantity of its product, but a little later on will equip a plant for manufacturing. The company will probably be in the market for shop equipment early next year. William C. Jones is president and general manager, George M. Donaldson is vice-president, Henry M. Sorrell, treasurer, and Oscar H. Wurzbacher, secretary.

Milwaukee

MILWAUKEE, Oct. 17.

An increase in sales which ordinarily would be regarded as negligible, but at present is conspicuous, is reported by machine tool manufacturers in the past week to ten days. At the same time there have been developments, particularly in the railroad situation, that are accepted as indicative of a much better prospect for business in the coming few months than that of six months ago. A great deal of hope of demand in the immediate future is pinned upon the possibi-

ties of a real resumption of buying by the railroads. This, of course, was hoped for immediately after Aug. 1, but without realization. The feeling now, however, is that there is substance in the anticipation.

The Milwaukee Public Sewerage Commission, City Hall, Milwaukee, is asking sealed bids until Nov. 11, at 1.30 p. m., for furnishing and installing all of the coal and ash-handling machinery, consisting of track hoppers, crushers, elevator, conveyors, skip hoist, motors and controllers, storage bins, spouts, automatic scales, ash cars and track, for the power plant and boiler house of the new Jones Island sewage disposal unit. The contractor will be given twelve months to complete the installation. The cost of the power plant unit complete is estimated at \$750,000. Contracts for generators, boilers, etc., have been let, as noted in THE IRON AGE some time ago. T. C. Hatton is chief engineer, and John H. Fowles, secretary of the sewerage commission.

The United States Gypsum Co., Chicago, will build a new block plant at Fort Dodge, Iowa, and has let the contract for the steel works to the Worden-Allen Co., Milwaukee. It will require 150 tons.

The Blever Casting Co., Slinger, Wis., a new \$10,000 corporation organized to take over and resume the operation of the Slinger gray iron foundry, is making changes and generally overhauling the shop and intends to start production Nov. 1. Joseph H. Blever, Port Washington, Wis., has been elected president and general manager; Frank J. Buche, attorney, Milwaukee, vice-president; Edmund J. Blever, Oconto, Wis., secretary and treasurer. J. H. Blever was connected for many years with the foundry department of the Gilson Mfg. Co., Port Washington, and E. J. Blever with the Montana Tractor Co., Oconto. Light and medium gray iron castings will be manufactured at Slinger.

The American National Mfg. Co., St. Louis, manufacturer of a combination parlor lamp and phonograph consisting mainly of bronze castings, has purchased the real estate and shop buildings of the Slater & Tuck Co., founder and machinist, at Beloit, Wis., for \$60,000. The property includes two and one-half acres and five buildings. The new owner will install brass foundry equipment and retool several buildings. It is planned to start operations within 60 days with 80 to 100 employees, producing from 25 to 30 units daily at the start. Martin Wiegand has been appointed works manager of the new Beloit plant. It is capitalized at \$1,000,000.

The Runnels-Cummins-Emery Corporation of Milwaukee, recently incorporated with a capital stock of \$100,000, has acquired the factory of the Folsom-Miller Co. at Merkesan, Wis., and will resume the manufacture of electric-motored washing machines, wringers and ironers for domestic, hotel and industrial purposes. Some changes will be made in the plant and a small list of new tools installed. Charles Cummins is vice-president and general manager.

The board of education, West Bend, Wis., will select an architect soon to design a new high school and vocational training institute, for which a bond issue of \$255,000 was authorized at a special election. It is hoped to begin work on foundations this fall and complete and equip the building in the spring of 1922. E. W. Bucklin is secretary of the board.

The Gallup-American Mining Co., Gallup, N. M., will build a new power plant, boiler house, stack, etc., requiring 300 tons of structural steel, which will be fabricated and erected by the Worden-Allen Co., Milwaukee.

Andrew Nelson and Christian Hansen, Racine, Wis., have formed a partnership to manufacture automobile bodies. A site at 944-948 Washington Avenue has been purchased and work will start at once on the construction of a one-story factory, 60 x 120 ft. Mr. Nelson formerly was superintendent of the body department of the Mitchell Motors Co., Racine.

Nels Thorbus, Brantwood, Wis., manufacturer of cutlery, surgical instruments, etc., contemplates the erection of a new shop at Ladysmith, Wis., to cost about \$10,000.

The Lake Laboratories, Inc., Elkhart Lake, Wis., a new corporation organized with 250 shares of common stock having no par value, will engage in the manufacture of electrical and mechanical devices, experimenting and testing the value of inventions and discoveries before patenting, and dealing in machinery, appliances, patents, etc. The incorporators are William C. Burk, E. C. Trotter and George C. Trotter, all of Sheboygan, Wis.

The V. Krefl Co., Eagle River, Wis., has let the general contract to Hugo V. Hertling, Inc., Manitowoc, Wis., for its new machine shop, 60 x 75 ft., to be equipped for manufacturing automobile equipment. It is to be ready Nov. 15 or Dec. 1. The equipment of the original factory at Two Rivers, Wis., is now being transferred to Eagle River and will be supplemented by some new tools.

The board of education, Merrill, Wis., probably will accept the lowest bids, entered by C. G. Torkelson, local contractor, to build a new high and vocational training school for \$172,000.

The American Hide & Leather Co., Chicago, which suffered a \$1,750,000 loss by the destruction of its Milwaukee tannery by fire on Sept. 28, has notified the building inspector of Milwaukee that it is having plans prepared for a new plant estimated to cost \$500,000 as the first unit of reconstruction. It is stated that work on foundations will be started this year.

The Atley Peterson Estate, Soldiers Grove, Wis., is taking bids until Oct. 20 through E. E. Dillon, consulting engineer, Madison, Wis., for the construction of a concrete dam and hydroelectric plant to cost about \$65,000. New water wheels, generator, switchboards, etc., will be purchased at once.

The board of education, Janesville, Wis., has accepted the bid of the J. P. Cullen Co., general contractor, local, to erect a new high school with manual training department, estimated to cost \$375,000 complete. The architects are Van Ryn & DeGelleke, Caswell Block, Milwaukee.

Cleveland

CLEVELAND, Oct. 17.

The market shows little change in the volume of orders, but the sentiment is better and dealers report that quite a few users are taking more interest in machinery than they have for the past few months, but are not likely to make purchases until their own operations improve so they will have use for additional equipment. The largest inquiry is from the Adams Axle Co., Findlay, Ohio, which is planning the purchase of equipment for the making of axles for the Durant motor cars. According to present plans, this company will equip four units for making axles, and it has prepared a list of equipment required for the first. Instead of sending out a general list, the company has taken up with individual manufacturers and dealers certain lines of equipment. While the early purchase of this machinery was expected, it is now understood that the buying will be deferred until January.

The General Motors Corporation has been figuring on the purchase of machinery for its Dayton, Ohio, plant for the manufacture of a new design of automobile with an air-cooled motor. However, it is understood that the company has changed its plans to build 1000 of these cars at once and will first make a very limited number for test purposes. Consequently, this purchase of machinery has been deferred. The machinery for the McKinley High School, Canton, Ohio, for which bids were received recently, has not been purchased, and is not likely to be placed for some time. Local sales are mostly in single tool orders, although one Cleveland manufacturer placed an order with a local machinery house during the week for six new machines and expects to purchase two or three additional tools.

One of the largest orders for hydroelectric equipment placed for some time has been given by the Alabama Power Co., Birmingham, Ala., for three 22,800 hp. single-runner vertical turbines for the Mitchell dam plant in Alabama. The order went to the Allis-Chalmers Co., Milwaukee, and amounts to approximately \$250,000.

The Alliance Machine Co., Alliance, Ohio, at a recent meeting of its board of directors decided to erect a forge shop 50 x 250 ft., and a large pattern shop on which work will be started at once. An expenditure of \$100,000 was authorized. The company as far as possible will furnish work for its own employees in building the plant extensions.

The Donahey Power & Products Co., recently incorporated with a capital stock of \$2,000,000, will build a plant near New Philadelphia, Ohio, for the manufacture of building material. Later, the company expects to make sewer pipe.

The Lima Sheet Metal Products Co., Lima, Ohio, has completed a new modern plant to which it is moving from its old quarters. The company manufactures sheet metal parts for automobiles, devoting particular attention to parts for trucks. C. L. Ackerman is president. Its capital stock was increased some time ago from \$50,000 to \$300,000 to provide for the expansion.

The Canton Oxygen Co., Canton, Ohio, plans the erection of a one-story factory building, 47 x 87 ft.

The Waukon Rubber Co., Elyria, Ohio, will soon take bids for the erection of its proposed new two-story and basement plant for the manufacture of general rubber goods, estimated to cost about \$75,000. The Akron Engineering Co., 92 East Mill Street, Akron, Ohio, is engineer. W. R. Huntington is president.

The Electric Alloy Steel Co., Youngstown, Ohio, is arranging for a preferred stock issue of \$750,000, of which \$500,000 will be issued at once, for general operations, improvements, etc. L. J. Campbell is president.

The Toledo Railways & Light Co., Toledo, Ohio, has been reorganized under the name of the Toledo Edison Co. The new organization has arranged for an increase in capital

from \$15,000,000 to \$25,000,000, the proceeds to be used for the purchase of the plant of the Acme Power Co., and for other extensions and improvements in plants and system.

The Distilled Water Ice Co., 523 West Federal Street, Youngstown, Ohio, will build a one-story ice plant, 70 x 160 ft., estimated to cost about \$100,000, with equipment.

The S. H. Vehicle Co., East Sixty-fifth and Morgan streets, Cleveland, manufacturer of wagons and parts, has commenced the erection of a three-story plant, 90 x 200 ft. and 90 x 100 ft., estimated to cost over \$150,000, including machinery. J. Kleinman is president.

The Schory & Schellhase Co., Sixth Street and Harrison Avenue, S. W., Canton, Ohio, will soon take bids for the erection of a two-story ice-manufacturing plant, 60 x 200 ft., estimated to cost close to \$200,000, with machinery.

Cincinnati

CINCINNATI, Oct. 17.

The month of October bids fair to be the best this year with the machine-tool manufacturers. Last week quite a number of orders for single machines were booked and some encouragement was given the trade by the receipt of a list from the Missouri, Kansas & Texas Railroad for approximately 75 items. A number of other railroads are said to be preparing lists which will likely be issued shortly. The Chesapeake & Ohio Railroad is expected to close shortly for three tools for its Huntington, W. Va., shops. The New York Central was a purchaser in the local market during the week and it is said will shortly issue a list covering its requirements for next year. A safe and lock company was also in the market for a number of tools and has already purchased a large radial drill. Dealers and manufacturers report the complexion of the inquiries as notably improved. Buyers are in some cases asking for price guarantees against decline for the balance of the year and in one instance a manufacturer has guaranteed his present prices until Jan. 1.

The Cincinnati Chemical Works, St. Bernard, Ohio, has let contracts for an addition to its plant, the general contract going to the J. R. Stevens Co., Odd Fellows Temple, Cincinnati. Work will commence immediately.

The Oldroyd Mining Machine Co., Cincinnati, on the petition of C. S. Oldroyd, president, has been placed in the hands of a receiver, Henry Neal Smith. The company has an authorized capital of \$500,000 of which \$200,000 is paid in, and manufactures coal mining machinery.

Indianapolis

INDIANAPOLIS, Oct. 17.

The Crane Co., 836 South Michigan Avenue, Chicago, will build a one-story machine shop at its branch works at East Chicago, Ind., in conjunction with a new warehouse at this location, estimated to cost about \$30,000. The company manufactures valves, steam fittings, etc. Bids will be taken at once.

Fire, Oct. 8, destroyed the power plant of the Interstate Public Service Co., Indianapolis, at Bedford, Ind., with loss estimated at about \$70,000. It will be rebuilt.

The American Car & Foundry Co., 165 Broadway, New York, is taking bids for the erection of a one-story building at its plant at Terre Haute, Ind., 125 x 290 ft., to be equipped as a machine and forge shop, costing \$60,000.

Fire, Oct. 11, destroyed the power house and other buildings and machinery at the flour mills of the Atlas Mills Co., Vincennes, Ind., with loss estimated at close to \$200,000. Plans are being considered for rebuilding.

The Ansted Engineering Co., Connersville, Ind., has closed arrangements with the Durant Motors, Inc., 1819 Broadway, New York, for the manufacture of six-cylinder motors for use in the Durant automobile. It is said that the contract covers the exclusive use of the Ansted motor, and will take the plant output for some time to come.

The Central South

ST. LOUIS, Oct. 17.

The Missouri, Kansas & Texas Railroad, George Scott, purchasing agent, has an inquiry out for 75 items for machine tool and foundry requirements, which is the largest list sent out by any railroad this year, being second in size to the list of the Southern Pacific of last year. The inquiries follow:

Three 36-in. motor-driven rip saws, including motors with suitable control apparatus.

Six 18-in. double back-geared quick-change gear engine lathes, 4 ft. between centers, automatic motor control, apron motor control and taper attachment.

Three 36-in. upright drills with sliding head back gear, positive gear, feed automatic stop and depth gage, hole in spindle to fit Morse taper No. 5.

Five floor-type motor-driven tool grinders, each with two grinding wheels, 12 x 1½ x 1 in.

Two 42-in. heavy duty hand saws, complete with a. c. motor.

One motor-driven bench tool grinder, with two 10 x 1 x ¾-in. grinding wheels.

One motor-driven forge blower, suitable for three blacksmith fires; one motor-driven forge blower, suitable for five blacksmith fires.

Three 26-in. selective all-gear head engine lathes, 6 ft. between centers, to be equipped with taper attachment, direct motor drive and apron motor control.

Two 36-in. x 36-in. x 10-ft. heavy duty planers.

One 44-in. vertical boring and turning mill.

One only 4-ft. semi-radial drill.

One 1100-lb. single-frame steam hammer with complete equipment.

One motor-driven forge blower suitable for five blacksmith fires.

One Buckeye, type F, or equivalent thereto, tire heater, complete with two sets of burner rings for 51-in. and 63-in. tires.

Two 32-in. back-gear heavy duty type crank shapers.

One horizontal punching machine.

One horizontal boring and drilling machine with steel spindle 4¼-in. diam.

Two portable electric grinders.

One only 36-in. vertical turret lathe, with one vertical and one side head.

Two electric rivet heaters.

Two double emery grinders, motor driven.

One only 2000-lb. single frame steam hammer.

One 20-in. slotter, with 220-volt d. c. motor.

One only 1½-in. double-head bolt cutter.

Two only 600 cu. ft. displacement motor-driven air compressors.

Two only 200-hp. cast-iron feed water heaters; four only 4½ x 3 x 4-in. duplex boiler feed pumps.

Two only 15-kw. motor generator sets, with switchboard for d. c. generator; four only 10 kva. high efficiency transformers.

One only electric tool grinder, double end, with capacity for 3 x 18-in. wheels.

One guillotine bar shear with capacity to shear rounds up to 2 in. or flats 7 x 1¼ in.

One automatic feed combination band and rip saw.

One iron frame automatic cutting off saw.

One only Osborn No. 405 or equivalent roll-over jolt machine.

One Berkshire Model "E" or equivalent air squeezer, portable type.

One only Simpson intensive foundry mixer No. 0.

One heavy single end punch and shear.

One 150-lb. Bradley upright helve hammer, complete.

One only belt-driven 150-lb. hammer, with motor attached to frame.

One only all-steel frame high knife alligator shear.

One only three-spindle automatic ball-bearing drilling machine.

One single spindle heavy pattern, high-speed vertical drilling and boring machine.

One only No. 3 Ferguson forging furnace; one only Ferguson rivet furnace; one only No. 5 Ferguson forging furnace; two only No. 4 Ferguson forging furnace; one only Ferguson double-door hammer furnace; one only No. 2 Ferguson forging furnace; one only No. 2 Ferguson forging furnace for Bradley hammer.

One only 5-ft. plain radial drill, motor driven.

Two only double emery wheel stands, motor driven.

One only plain drilling machine, Baker type, size 2½ in., motor driven.

One only plain drilling machine, Baker type, size 2 in., motor driven.

One only plain drilling machine, Baker type, size 1½ in., motor driven.

Two only 30-hp. a. c. 440 volts, 60 cycles, 3-phase induction motors, complete with starters.

One only 48-in. frog and switch planer.

One only quadruple 2-in. bolt cutter.

One only 40-hp., 230-volt d. c. current reversible motor, with flexible flange coupling and appliances, for direct connection to 36-in. x 14-ft. frog and switch planer.

One only motor-generating set, 125-kw. motor to be 60 cycles, 440 volts, 3 phase, alternating current.

One only 32-in. back geared heavy-duty shaper, fitted with 3-phase, 60-cycle, 220-volt motor.

One only 36-in. engine lathe.

One only forge blower, motor driven, suitable for 4 to 6 blacksmith fires.

One only motor-driven tool grinder.

One only single-end motor-driven punch and shear.

One only 24-in. engine lathe, 6 ft. between centers.

One only 20-hp., 900-r.p.m., 3-phase, 60-cycle, 220-volt induction motor.

One only 18-in. engine lathe, 4 ft. between centers.

One only 4-ft. semi-radial drill.

One only 300-lb. blacksmith anvil.

The Rogers Foundry Co., Eleventh and Pearl streets, Joplin, Mo., has completed plans for the erection of a one-story foundry on West Tenth Street, to cost about \$35,000.

The Unit Motor Co., 115 West Thirteenth Street, Kansas City, Mo., has leased additional property totaling about 8000 sq. ft. for the manufacture of gasoline engines. A complete machine shop will be installed. Samuel McCubbin is president.

The St. Louis Lead & Oil Works, International Life Building, St. Louis, will commence the immediate erection of a one-story power house at its plant at Manchester and Sublette streets.

The City Ice Co., Twenty-first and Campbell streets, Kansas City, Mo., will build a new ice-manufacturing plant, 42 x 80 ft., at Twentieth and Washington streets, to cost about \$75,000.

The Forshaw Stove & Heating Co., 111 North Twelfth Street, St. Louis, is planning for the erection of a plant, 25 x 100 ft., adjoining its present works, estimated to cost about \$75,000. Joseph Forshaw is president.

The Safety Semaphore Co., 724 South Fourth Street, Louisville, recently organized, will operate a local plant for the manufacture of automobile signal devices. W. H. Hinton is president, and R. E. Davis, secretary and treasurer.

The El Dorado Oil Refining Co., 328 Mayo Building, Tulsa, Okla., is planning for the installation of machinery in a local building for the establishment of a new oil refining plant. The refinery will develop a capacity of about 2000 barrels a day, with equipment estimated to cost close to \$200,000. F. L. Severson heads the company.

Fire, Oct. 3, destroyed the main building at the plant of the Yukon Mill & Elevator Co., Yukon, Okla., with loss, including machinery, estimated at \$200,000.

The St. Louis and San Francisco Railroad has an inquiry out for one 100-ton hydraulic bushing press belt drive and one 42-in. vertical-type side bead turret lathe motor drive.

The Ruth Boiler Works, Tulsa, Okla., has been organized to operate a local plant for the manufacture of boilers, tanks and other plate products. The company is headed by H. C. Ruth and P. A. Wilson, Tulsa.

V. L. Hesterly, Miami, Okla., and associates are planning to erect a plant at Henryetta, Okla., for the manufacture of electrical equipment and devices.

The Peerless Wire Fence Co., Adrian, Mich., has acquired the plant of the Bosworth Bag Co., Memphis, Tenn., for the establishment of a new branch works for the manufacture of ornamental and other wire fencing. Operations will be inaugurated at an early date.

The Missouri, Kansas & Texas Railway Co., Railway Exchange Building, St. Louis, plans to erect a new car and locomotive reclamation plant at Parsons, Kan., to cost about \$150,000, with machinery. A. L. Sparks, company address, is engineer.

The Central Missouri Coal Mining Co., Central Trust Building, Jefferson City, Mo., plans to install a steam shovel, electrical equipment and other machinery at coal properties to be developed at Holts Summit, Mo. John McManus is secretary and treasurer.

Fire, Oct. 2, destroyed the plant of the Downs Ice & Light Co., Downs, Kan., with loss of \$90,000. It will be rebuilt immediately.

The Stryker Kot-N-Wood Products Co., Memphis, Tenn., has plans in progress for the erection of the first unit of a new plant for the manufacture of wallboard products. It will be 60 x 200 ft., with power house adjoining. The machinery will include an hydraulic press, mixing equipment, etc. George B. Stryker is president.

The Commercial Mining Co., Connellsville, Pa., is planning for the installation of new electrical equipment and other machinery at its coal properties at Sergeant, Ky. The company recently increased its capital to \$500,000.

The Morrillton Compress Co., Morrillton, Ark., is planning to rebuild its cotton compressing plant, recently destroyed by fire with loss of about \$200,000, including equipment.

The Camden Oil & Refining Co., Camden, Ark., plans to erect an oil refinery in the vicinity of Pine Bluff, Ark., with daily output of about 500 barrels, estimated to cost about \$50,000. H. M. Jones is president.

California

SAN FRANCISCO, Oct. 11.

The Angelus Sanitary Can Machine Co., 282 San Fernando Building, Los Angeles, has awarded a contract to the Austin Co., Los Angeles, for the erection of a one-story plant, 90 x 160 ft., estimated to cost about \$55,000.

The Fresno Tire & Rubber Co., Fresno, Cal., plans to erect a plant at Selma, Fresno County, estimated to cost about \$200,000, with machinery.

The Santa Fe Railroad Co., engineering department, Kerckhoff Building, Los Angeles, has plans under way for the erection of a new machine shop, 65 x 500 ft., at its car and locomotive shops at San Bernardino, Cal. An electric traveling crane will be installed, with runway extending 180 ft. beyond one end and 100 ft. beyond the other.

The Monolithic Hollow Concrete Form Corporation, 326 Pacific Finance Building, Los Angeles, is considering the erection of a plant on Porter Street for the manufacture of concrete forms.

The Carpinteria Clay Products Co., Carpinteria, near Santa Barbara, Cal., recently organized at \$150,000, has arranged for the establishment of a local plant for the manufacture of bricks and other burned clay products. The initial equipment installation will be for brick production, with other machinery to be installed later for the manufacture of tile, etc. The company is headed by Lyman T. Gage and B. C. Sutton.

Fire, Oct. 5, destroyed a portion of the oil refinery of the Associated Oil Co., Martinez, Cal., with loss estimated at about \$50,000. It will be rebuilt immediately.

The Imperial Valley Gypsum & Oil Co., Spreckles Building, San Diego, Cal., has acquired property at Maria, Imperial County, for the erection of a plant for the manufacture of gypsum products. The company has land, about 25 miles distant, for raw material supply. The new works are estimated to cost about \$150,000, with machinery.

The San Joaquin Light & Power Corporation, Fresno, Cal., has arranged for a bond issue of \$1,500,000, the proceeds to be used for general operations, extensions, etc.

The Gulf States

BIRMINGHAM, Oct. 17.

The Marine Service Corporation, Miami, Fla., has been chartered under State laws to operate a local shipbuilding and repair plant. The company is headed by C. T. Roberts and J. E. Sheldon, Miami.

The Alexandria Cotton Oil Co., Alexandria, La., is planning to rebuild the portion of its plant recently destroyed by fire, with loss estimated at about \$100,000, including equipment.

Fire, Oct. 8, destroyed the repair and service plant of the Franklin Motor Car Co., 1601 South Ervay Street, Dallas, Tex., with loss estimated at about \$50,000.

The Alabama Power Co., Birmingham, Ala., has work under way for the construction of a generating plant on the Coosa River, near Verbena, Ala., estimated to cost over \$5,000,000, complete.

The Earlington Ice Co., Earlington, Ky., recently organized, has completed plans for the erection of a new plant, 60 x 80 ft., to be equipped as an ice-manufacturing and cold storage works. It is proposed to install ice-making machinery to cost \$30,000, with capacity of about 40 tons per day. Frank D. Nash is president, and Charles W. Francis, manager.

The Travis Wire Co., San Antonio, Tex., has been chartered under State laws to manufacture wire goods. The incorporators are J. W. Wharton and W. B. Moss, San Antonio.

The Dallas Oil Refinery Co., 3131 Oak Lane, Dallas, Tex., plans to erect a local oil refining plant.

The Trinity Oil Corporation, Dallas, Tex., has acquired the local plant of the Eastland Oil & Refining Co. The works, heretofore used for skimming, will be remodeled into a complete oil refinery and necessary machinery installed. The plant will have a capacity of about 4000 barrels per day. A plant for the manufacture of lubricating oils is also planned.

The Gulf Coast Power & Light Co., Corpus Christi, Tex., recently organized, plans to erect a new central electric generating plant for service in this section. R. W. Morrison is head.

The Sarasota Ice & Cold Storage Co., Sarasota, Fla., is planning for extensions and improvements in its plant to cost close to \$25,000. It is proposed to double the present capacity. H. W. Lind, Bradentown, Fla., is president.

The Harrisburg Machine Co., Harrisburg, Tex., recently

organized, will operate a local machine and repair works, 38 x 125 ft. R. A. Fenzl, Harrisburg, is vice-president and manager.

Fire, Oct. 5, destroyed a portion of the plant of the Howe Grain & Elevator Co., near Sherman, Tex., with loss estimated at about \$75,000, including equipment.

The Illinois Central Railroad Co., Central Station, Chicago, plans to erect a number of new buildings at its car repair works at McComb, Miss., to replace the structures recently destroyed by fire.

Seattle

SEATTLE, Oct. 11.

The Bellingham Steel Corporation, Bellingham, Wash., has acquired 10 acres of land in the Happy Valley section and plans to erect an iron and steel works.

The Okanogan Valley Power Co., Brewster, Wash., has tentative plans for the installation of a second generating plant unit at its hydroelectric plant on the Similkameen River. Eugene Enloe is president.

The common council, Cottage Grove, Ore., plans the installation of a municipal lighting plant, to cost about \$50,000, bonds having been voted.

The Puget Sound Power & Light Co., Seattle, Wash., is planning for a note issue of \$1,000,000, the proceeds to be used for general operations, extensions and improvements in power plants and system.

The Concrete Pipe Co., Portland, Ore., plans to erect a new plant in the Albina industrial section, to cost about \$30,000.

The Freeland Furniture Co., 970 Macadam Street, Portland, Ore., has plans for enlargements in its plant to double the present capacity.

The Prouty Timber Co., Timber, near Astoria, Ore., is considering the rebuilding of its plant, recently destroyed by fire with loss estimated at about \$150,000, including machinery. The mill has been employing 200 men.

The Northern Radio & Electric Co., Seattle, Wash., has been chartered under State laws to manufacture wireless equipment, instruments, etc. The incorporators are R. W. Bell and H. S. Tenny, Seattle. The company is represented by McClure & McClure, Hoge Building.

The Western Spar Co., Portland, Ore., will commence the immediate erection of a new sawmill and veneer plant on the former shipyard property at Columbia City, near St. Helens, Ore., estimated to cost about \$100,000, including machinery.

Canada

TORONTO, Oct. 17.

Inquiries for machine tools are steadily increasing from nearly all centers of the Dominion and at the present time many of these are turning into sales. Business generally is on the upgrade and sales of dealers for the past month have exceeded those of any month this year. Industrial plants have now reached the stage in their operations where further delay may prove fatal. Several concerns have announced their intention of locating plants in the Dominion and of having these ready for operation by next spring, so it will be necessary for those interested to enter the market almost immediately for the required machinery and tools for equipping these. The demand for equipment for municipal plants continues steady and a number of cities have announced their intention of increasing the capacity of water works, sewage plants, electric plants and various other municipal works for which equipment will be required. The outlook at the present time appears brighter than it has at any time this year and Canadian machinery and tool dealers are quite optimistic with regard to their future business.

Knight Bros. Co., Ltd., Burk's Falls, Ont., is in the market for an engine lathe, 12-ft. bed, 24 to 30-in. swing, back gear screw-cutting compound rest; iron planer, 30 x 30 in., with 8-ft. bed; power hack saw, 6 x 6 in.

The board of education, Fort William, Ont., is in the market for tools for a technical school.

The Canadian Automatic Carburetor Co. has secured a site and intends establishing a plant at the corner of Royce Avenue and Dundas Street, Toronto.

Albert Frances, Dunnville, Ont., has secured a three-acre site at Port Colborne, Ont., where he proposes to establish a foundry in the immediate future.

Prince Rupert, B. C., will spend \$75,000 on improvements to waterworks plant and system. F. S. Clements is engineer.

Bids will be received by F. L. Heath, town clerk, Georgetown, Ont., until Oct. 25 for pumping machinery consisting of two units, 400 gal. each.

Current Metal Prices

On Small Lots, Delivered from Merchants' Stocks, New York City

The quotations given below are for small lots, as sold from stores in New York City by merchants carrying stocks.

As there are many consumers whose requirements are not sufficiently heavy to warrant their placing orders with manufacturers for shipment in carload lots from mills, these prices are given for their convenience:

Iron and Soft Steel Bars and Shapes

Bars:	Per Lb.
Refined bars, base price	2.78c.
Swedish bars, base price	10.00c.
Soft steel bars, base price	2.78c.
Hoops, base price	3.88c.
Bands, base price	3.43c.
Beams and channels, angles and tees	
3 in. x 1/4 in. and larger, base	2.88c.
Channels, angles and tees under 3 in. x	
1/4 in., base	2.78c.

Merchant Steel

	Per Lb.
Tire, 1 1/2 x 1/2 in. and larger	2.75c.
(Smooth finish, 1 to 2 1/2 x 1/4 in. and larger) ..	2.95c.
Toe calk, 1/2 x 3/8 in. and larger	3.45c.
Cold-rolled strip, soft and quarter hard ..	6.25c. to 7.25c.
Open-hearth spring steel	4.25c. to 6.00c.
Shafting and Screw Stock:	
Rounds	3.88c.
Squares, flats and hex	4.38c.
Standard cast steel, base price	14.00c.
Extra cast steel	17.00c.
Special cast steel	22.00c.

Tank Plates—Steel

1/4 in. and heavier	2.88c.
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Sheets

Blue Annealed

	Per Lb.
No. 10	3.28c. to 3.53c.
No. 12	3.33c. to 3.58c.
No. 14	3.38c. to 3.63c.
No. 16	3.48c. to 3.73c.

Box Annealed—Black

	Soft Steel C. R., One Pass Per Lb.	Blued Stove Pipe Sheet, Per Lb.
Nos. 18 to 20	3.80c. to 4.05c.	.....
Nos. 22 and 24	3.85c. to 4.10c.	4.50c.
No. 26	3.90c. to 4.15c.	4.55c.
No. 28	4.00c. to 4.25c.	4.65c.
No. 30	4.25c. to 4.50c.	.....
No. 28, 36 in. wide, 10c. higher.		

Galvanized

	Per lb.
No. 14	4.10c. to 4.35c.
No. 16	4.25c. to 4.50c.
Nos. 18 and 20	4.40c. to 4.65c.
Nos. 22 and 24	4.55c. to 4.80c.
No. 26	4.70c. to 4.95c.
No. 27	4.85c. to 5.10c.
No. 28	5.00c. to 5.25c.
No. 30	5.50c. to 5.75c.
No. 28, 36 in. wide, 20c. higher.	

Welded Pipe

Standard Steel

	Black Galv.	Wrought Iron
1/2 in. Butt... —55 —40		3/4 in. Butt... —30 —13
3/4 in. Butt... —60 —46		1-1 1/2 in. Butt... —32 —15
1-3 in. Butt... —62 —49		2 in. Lap... —27 —10
3 1/2-6 in. Lap... —59 —45		2 1/2-6 in. Lap... —30 —15
7-8 in. Lap... —55 —41		7-12 in. Lap... —23 —7
9-12 in. Lap... —54 —40		

Steel Wire

	Per Lb.
Bright basic	4.00c.
Annealed soft	4.00c.
Galvanized annealed	4.75c.
Coppered basic	4.50c.
Tinned soft Bessemer	6.00c.

*Regular extras for lighter gages.

Brass Sheet, Rod, Tube and Wire

BASE PRICE

High brass sheet	16 1/4 c. to 19 1/4 c.
High brass wire	17 1/4 c. to 21 1/4 c.
Brass rod	14 1/4 c. to 20 3/4 c.
Brass tube, brazed	27 1/2 c. to 31 1/2 c.
Brass tube, seamless	19 c. to 20 1/2 c.
Copper tube, seamless	20 1/2 c. to 22 3/4 c.

Copper Sheets

Sheet copper, hot rolled, 24 oz., 20 1/2 c. to 23 1/2 c. per lb. base.
Cold rolled, 14 oz. and heavier, 2c. per lb. advance over hot rolled.

Tin Plates

Bright Tin	Grade	Grade	Coke—14-20	Primes	Wasters
	"AAA"	"A"			
	Charcoal	Charcoal			
	14x20	14x20			
IC..	\$10.75	\$9.25	80 lb...	\$6.80	\$6.55
IX..	12.00	10.75	90 lb...	6.90	6.65
IXX..	13.75	12.25	100 lb...	7.00	6.75
IXXX..	15.50	14.00	IC...	7.15	6.90
IXXXX..	17.00	15.75	IX...	8.15	7.90
			IXX...	9.15	8.90
			IXXX...	10.15	9.90
			IXXXX...	11.15	10.90

Terne Plates

8-lb. Coating 14 x 20

100 lb.	\$7.50
IC	7.75
IX	8.00
Fire door stock	11.00

Tin

Straits, pig	30c.
Bar	36c. to 40c.

Copper

Lake ingot	15 1/2 c.
Electrolytic	15 1/4 c.
Casting	15c.

Spelter and Sheet Zinc

Western spelter	6 1/4 c. to 6 1/2 c.
Sheet zinc, No. 9 base, casks	11 1/2 c. open 12c.

Lead and Solder*

American pig lead	5 3/4 c. to 6 1/4 c.
Bar lead	6 3/4 c. to 7c.
Solder, 1/2 and 1/2 guaranteed	20c.
No. 1 solder	18c.
Refined solder	15 1/2 c.

*Prices of solder indicated by private brand vary according to composition.

Babbitt Metal

Best grade, per lb.	80c.
Commercial grade, per lb.	40c.
Grade D, per lb.	35c.

Antimony

Asiatic	6 1/2 c. to 6 3/4 c.
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Aluminum

No. 1 aluminum (guaranteed over 99 per cent pure), in ingots for remelting, per lb.	29c. to 31c.
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Old Metals

Business has quieted down in sympathy with the new metal market. Values generally are about the same. Dealers' buying prices are as follows:

	Cents Per Lb.
Copper, heavy and crucible	10.25
Copper, heavy and wire	9.75
Copper, light and bottoms	8.00
Brass, heavy	5.00
Brass, light	4.00
Heavy machine composition	7.50
No. 1 yellow brass turnings	4.25
No. 1 red brass or composition turnings	6.50
Lead, heavy	3.75
Lead, tea	2.50
Zinc	2.25

